ONTARIO SUSTAINABLE ENERGY ASSOCIATION'S COMMENTS ON CONCENTRICS'S PAPER:

"REVIEW OF DEMAND SIDE MANAGEMENT (DSM) FRAMEWORK FOR NATURAL GAS DISTRIBUTORS"

EXECUTIVE SUMMARY

The Ontario Sustainable Energy Association (OSEA) is pleased to have this opportunity to comment on the DSM Framework for natural gas distributors (NGDs). OSEA compliments Concentric on its succinct description of the three regulatory approaches[1] to DSM and thorough recommendations in its report.

OSEA proposes a fundamental change to the framework for DSM and conservation promotion through the adoption of a performance based model for DSM. We believe this model is achievable and goes beyond the "Aggressive" approach set out in the Concentric report. A performance based model would by its nature be more customer focused and centered on continuous improvement.

In summary, it is our view that a successful DSM framework will be achievable if more focus is put on performance and innovation and less on short term evaluation. OSEA would prefer to see NGDs develop five (5) year plans with strategic blends of programs that reflect customer needs, market opportunities and economic conditions. The current framework drives NGDs to use DSM expenditures within the year on efforts that will result in savings in the same year. Funds should be allocated to work that will deliver future benefits. Optimal performance can only be achieved through the combined use of more efficient technology with equal attention to long term standards and system design.

For the purpose of this submission, we have grouped our comments according to the 14 Elements set out in the Concentric Report and have provided our commentary for each Concentric recommendation. We begin with some background information on OSEA's views and approach to DSM and conservation along with a description of the Performance Based Model for DSM.

[1] As excerpted in summary in Appendix A for future reference.

OUR VIEW AND APPROACH

OSEA is a province-wide, member-based, non-profit organization representing private citizens, cooperatives, farmers, First Nations, businesses, institutions and municipalities. OSEA's vision is that every Ontarian becomes a conserver and generator of sustainable energy either through a household or through a local community owned business, contributing to the transition to 100% sustainable energy. As a founding member of the Green Energy Act Alliance (GEAA) that set the stage for the government's development and passage of the *Green Energy and Green Economy Act,* we defined conservation as:

"Any measure that reduces a customer's overall demand for energy and/or a customer's demand for purchased energy. Specifically:

- *energy efficiency;*
- *behavioural and operational changes, including application of benchmarking, interval meters or "smart" control systems;*
- *load management -- interruptible and dispatchable loads, dual fuel applications, thermal storage, and demand response;*
- *fuel switching which reduces the total system energy for a given end-use particularly with respect to the following:*
  - *Geo-exchange systems which are also referred to as earth energy systems, or geothermal heat pump systems. This heat 'exchange' between the ground and the building is accomplished by using pump and compressor technology*
  - *clean energy systems which make use of wasted energy such as: combined heat and power; local generation that uses presently wasted energy from industrial plants; micro grids within local distribution companies, including private wires and pipes in local geographic areas; and recycled exhaust heat from gas pipeline compressor stations."*

Traditional approaches to conservation, or demand side management, have focused on "technology based" interventions, most often using incentives to encourage the purchase of higher efficiency equipment as a replacement for "standard" efficiency equipment. In our view, this approach does little to effect any long term change in the decision making process of consumers, whether, home owners, businesses or institutions. In addition, business institutions are more focused on their primary business and concern themselves only with timely bill payment.

Increasingly, other sectors such as building and Industrial sector, use models such as REALpac[2] (see report included in Appendix B) and The Energy Coach[3] ™ (see Appendix C) to pursue broader, more comprehensive frameworks for energy management based on benchmarking, actual performance and measurement of results.

Traditionally, regulated utilities or governments were "the only game in town" driving conservation. This is no longer the case in Ontario. We have sector specific organizations, nonprofit organizations and community based groups all contributing to the agenda. A successful DSM framework will be one which capitalizes on these opportunities rather than competes with them. A particularly important opportunity for harmonization will arrive when the Ontario government issues the regulations with respect to the requirements for energy management plans in the public sector. Already, the Ontario Realty Corporation is pursuing a performance based approach to conservation[4] consistent with the REALpac process. Set out below is an excerpt from the REALpac report.

> *"A roadmap is presented for achieving and sustaining high levels of energy performance in individual buildings and portfolios. The roadmap begins with benchmarking, and works through to performance monitoring, feedback and continuous improvement. Canada's real estate industry is positioned to have a meaningful impact on the climate change mitigation agenda, through both its own potential to demonstrate greenhouse gas emission reductions, and the example it can provide. The methodology, metrics, standards and tools described in this paper did not exist two years ago. The commercial office sector and government real property departments have shown leadership, through their participation in the CaGBC pilot projects, in both substantiating the opportunity for deep cuts in energy use and emissions, and developing the means to achieve and sustain them. REALpac's "20 by '15" target takes this leadership to the next level."*

OSEA suggests that such an approach can provide the OEB, ratepayers and consumers with great assurance of the veracity of savings and respect the fundamental drivers of the fourteen elements in the Draft Gas DSM Guidelines.

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[2] REALpac, the Real Property Association of Canada is Canada's senior national real property association whose mission is to bring together the country's real property investment leaders to collectively influence public policy, to educate government and the public, and to ensure stable and beneficial real estate capital and property markets in Canada. www.realpac.ca

[3] The Energy Coach™ is a energy management best practices program. It will enable users to become more competitive, identify key improvement opportunities for energy planning, utilization and metrics and will potentially reduce their manufacturing input costs, relating to energy consumption and environmental footprint.

[4] "Ontario Realty Corporation is committed to systematically working towards energy efficiency targets for high performing buildings across its whole portfolio. The RealPac 2015 target is a useful development in moving this agenda forward." Gavin Maher, Senior Sustainability Program Specialist, Ontario Realty Corporation

Further, we support the following key conservation elements that established the GEAA's position and targets for conservation:

- A mandated commitment to a continuous improvement approach to conservation with a minimum 2.5% annual (compounding) reduction in energy resource needs from 2011 until 2027.
- Energy pricing that reflects its true cost and provides signals to consumers to manage their energy demand and consumption.
- Priority for vulnerable consumers (including relevant industrial users) to reduce their energy burden through conservation, bill assistance, innovative utility policies and stronger consumer protection.

In our view, the optimum level of conservation is not the "cheapest":

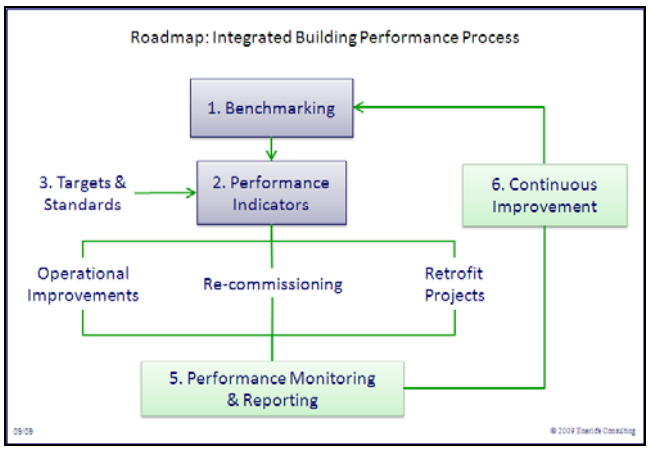
- All kW and kWh are not equal: "load shape" of conserved electricity is important to understand its value to customers and the system.
- Sustainable savings have greater value than those lasting the life of the measure: e.g. screw in light bulbs vs. lighting redesign.
- Most cost effective savings are designed at the outset – lost opportunities in new construction and renovation should be avoided.

It is with the foregoing views and approach that we offer our commentary herein.

COMMENTARY

I. ALTERNATIVE DSM FRAMEWORK: PERFORMANCE BASED APPROACH TO CONSERVATION

OSEA strongly supports moving to a performance based approach to conservation. We support the REALpac model, as detailed below. The following diagram shows the fundamentals of this approach from a customer's point of view and the text below explains the steps as excerpted directly from the REALpac report. We also enclose in Appendices D and E power point presentations that illustrate the performance based conservation model and how such model could work in the single family residential sector.



Step 1: Benchmarking

Benchmarking is the starting point for addressing energy efficiency. High performance can be used by leasing agents to market a building. Lower performance should factor into target setting and individual performance objectives. Executives should know how their properties compare with each other and with the office buildings market as a whole.

Step 2: Performance Indicators

Beyond total energy use, benchmarking and drilling down into component parts of energy use helps create building-specific targets, and identify which buildings are candidates for operational improvements, re-commissioning and/or retrofits. Interval meter profiles allow identification and quantification of operational improvements. The interpretation of utility data to guide conservation action is becoming an essential management capability.

Step 3: Targets & Standards

Every building can have an individual energy target, based on its actual and potential energy performance. The target guides allocation of effort and resources, planning of improvements, and performance objectives for staff and service providers. Building owners should adopt good practice design/retrofit standards for individual building systems, as identified by the CaGBC program, to be incorporated into specifications and service agreements.

Step 4: Operations, Recommissioning and Retrofitting

There are typically three streams of activity involved in implementing energy efficiency improvements in existing buildings. First are operations – reducing “on-time” for building systems, shutting equipment off during unoccupied periods and adjusting building control “set-points”. This is the least cost, highest payback stream, but requires training and accountability for operators and engagement of tenants.

Second is re-commissioning – testing, diagnosing, repairing, upgrading and adjusting building systems to perform to their best potential. This is generally a relatively low cost stream with a good payback, and requires direct involvement of operators as a learning process, and to ensure high performance is maintained over time.

The third stream is system redesign and retrofit projects – lighting, ventilation and hydronic system upgrades, and replacement of plant and equipment. This is the highest cost stream and requires a robust business case.

Every building has its own unique set of opportunities. The performance indicators derived from benchmarking point to which streams apply to which buildings. In general, the lower cost streams should be implemented first in order to gain immediate savings with high returns, engage and train operators, and build internal confidence and capacity for tackling large capital projects.

Step 5: Performance Monitoring

Transparency of performance maintains organizational engagement and commitment, and drives continuous improvement. Operators and property managers should have access to monthly changes and trends in energy use for their building so they can make the connections between cause and effect – how their actions and operating practices impact performance – and take appropriate measures for improvement. Executives should see quarterly progress reports compared with baselines and targets. High performing buildings and large improvements should be recognized and celebrated, and corporate reporting should include targets, actual savings, and profiles of measures implemented and improvements made.

Step 6: Continuous Improvement

Energy performance management is a continuous management system which needs to respond to new standards and technology, and improved operating procedures. As the energy efficiency of the office building sector as a whole continues to rise, and better standards and practices continue to emerge, so individual building targets are raised and the cycle of continuous improvement takes us to *20 by '15* and beyond.

The role of NGDs in the rest of the above steps could be as follows:

Steps in REALpac Model	Role of NGD in Performance Based Model
Step 1: Benchmarking	Provide the metered data to customer to inform benchmarking.
Step 2: Performance Indicators	Assist in the building and technical analysis to develop performance indicators.
Step 3: Targets & Standards	Assist in the building and technical analysis to develop targets and standards.
Step 4: Operations, Recommissioning and Retrofitting	Provide workshops, technical advice and guidance re: operational improvements and recommissioning.

Steps in REALpac Model	Role of NGD in Performance Based Model
	Provide financial incentives based on performance criteria re: retrofitting.
Step 5: Performance Monitoring	Provide the metered data to inform performance monitoring and reporting.
Step 6: Continuous Improvement	Provide ongoing support to ensure that savings persist.

II. COMMENTS ON COST EFFECTIVENESS TEST

Concentric Recommendation 1: In order to evaluate DSM programs that help the Board achieve more stringent conservation and climate change objectives, Concentric recommends that the Board consider adopting the Societal Cost Test (which includes all reasonably estimable externalities including CO2 emissions) as its primary method of assessing the cost effectiveness of proposed DSM programs.

OSEA Comment: The Societal Cost Test should be applied to a multi-year plan not a three or five year series of annual plans. Industry experience shows that real long term savings come with a multi-year approach (Appendices A and B). The Natural Gas DSM framework should enhance that approach rather than try to change it.

Concentric Recommendation 2: Under this approach, the Board would approve all energy efficiency and conservation programs with a benefit/cost ratio greater than 1.0 (subject to the budget constraints discussed under Issue #6 below).

OSEA Comment: Again, the ratio should be applied against a multiyear plan not evaluated on an annual basis.

Concentric Recommendation 3: Concentric recommends that the Board consider using the Program Administrator Cost test to prioritize the proposed DSM programs and measures. Priority would be given to those programs and measures with the highest PAC test results, thereby aligning DSM targets with DSM spending.

OSEA Comment: While OSEA contends that its suggested approach to conservation will result in more effective PAC tests, OSEA strongly disagrees that the Program Administrator Cost test should be used to prioritize DSM programs. Such an approach, when combined with one year plans is institutionalizing "cream skimming" and ignoring lost opportunities. It also fails to maximize benefits for customers and society. OSEA would prefer to see the companies develop multiyear plan with a strategic blend of programs that reflect customer needs, market opportunities and economic conditions. The following excerpt from "The Guide for the Selection of Energy Efficient Technologies" illustrates an example of best practice advice to

facility managers. It is important that utility DSM programs build on such approaches rather than to develop or time "DSM interventions" purely on a regulatory schedule.[5]

> *"It is very important to avoid taking initial advantage of the quick-fix, low-cost options alone, while at the same time losing the opportunity to make much higher savings later. De-lamping existing light fixtures can be an effective way of generating savings at low cost. The savings can be used later to upgrade the fixture when it needs replacement. Replacing old ballasts with conventional electromagnetic ones, however, without considering a full lighting retrofit, means that the opportunity to save three times as much energy has been lost for up to 10 years. In most cases, a lighting retrofit with electronic ballasts, T8 lamps, and reflectors is cost effective and easily financed. Wait until the whole fixture needs upgrading and then do a comprehensive retrofit. Take a long term comprehensive view, and use the replacement time for each piece of energy using equipment to your advantage. For example, if an old chiller has a few more years of life, but it would be cost effective to replace it now with a more efficient one, wait until you have considered efficient lighting options and other upgrades that reduce the cooling load. Consider the cost effectiveness of the whole package, including a smaller chiller, and implement the package over a three year period. Use the low cost savings from de-lamping, operational efficiencies, maintenance improvements, etc. to cross subsidize more expensive measures. If measures and upgrades can be done sequentially without losing opportunities, this can be done by carrying forward savings and reinvesting them in more expensive options. Alternatively, package all of the options together in a multi-year plan and finance the whole package through internal investment, lease, loan, or energy performance contracting. The result is much higher savings at a lower overall cost."*

This is even more important in the new construction market when the appropriate time to work with architects, engineers' and developers may be a number of years before the project is built. However, the current framework drives the companies to use DSM expenditures in any given year on efforts that will result in energy savings in the same year. OSEA recommends a multi-year budget and framework with funds allocated to work that will deliver future benefits.

OSEA also notes that both Concentric and the draft guidelines have virtually ignored the participant cost test. OSEA suggests that this test be used to select programs for the DSM portfolio and a basis for setting priorities. At the very least, no program that does not pass the participant cost test should be pursued by any agency.

[5] Saskatchewan Energy Management Task Forces: A Guide for the Selection of Energy Efficient Technologies. http://www.emtfsask.ca/pdfs/gdenefftech.pdf

<u>Concentric Recommendation 4</u>: Concentric recommends that the Board separately evaluate the cost effectiveness of proposed DSM programs for low-income customers

OSEA Comment: OSEA agrees that the Board should separately evaluate programs for low income consumers.

<u>Concentric Recommendation 5</u>: Concentric recommends that the Board consider adopting a Societal Cost test threshold for low-income programs of 0.60 to 0.75. This range is somewhat more aggressive than the 0.80 TRC result used in British Columbia, but more conservative than the 0.25 modified Participant Test result adopted in California. The recommended range of 0.60 to 0.75 is higher because it utilizes the Societal Cost test (which includes externalities), while the range in other jurisdictions relates to the TRC test or the Participant test (which do not include externalities).

OSEA Comment: OSEA prefers that the Board proceed with the approach developed by the Low Income Energy Assistance working group in the summer of 2009. To summarize:

The design and delivery of DSM programs for low-income customers should follow the principles presented in the Final Report of the Conservation Working Group on the proposed short-term (2010) framework for natural gas low-income DSM. These principles should be adopted instead of those stated in the Concentric Report. These principles are as follows: Low-income natural gas DSM should:

- *Be accessible to low-income natural gas consumers*[6]
  - *Be accessible province-wide in the long term*
  - *Require no upfront cost to the low-income energy consumer and result in an improvement in energy efficiency within the consumer's residence*
  - *Address non-financial barriers (e.g. communication, cultural and linguistic)*
- *Be delivered in a cost-effective manner*[7]
  - *Provide a simple, non-duplicative, integrated and coordinated application, screening and intake process for the low-income conservation program that covers all segments of the low-income housing market including, for example, homeowners, owners and occupants of social and assisted housing, and owners of privately owned buildings that have low-income residents, whether or not these residents are responsible for paying their energy bills*

[6] 'Consumer' includes persons living in residences and pay their energy costs or with energy costs included in their rent.
[7] The traditional measure of cost-effectiveness for natural gas DSM in Ontario has been the TRC test. While the natural gas utilities agree that the principle of cost-effectiveness for low-income programs is an important one, they emphasize that they do not believe TRC is the appropriate measure at this time.

- *Use criteria for determining program eligibility*[8]
- *Provide integrated, coordinated delivery, wherever possible, with electric LDCs and natural gas utilities*[9]*; provincial and municipal agencies; social service agencies and agencies concerned with health and safety issues (Encourage collaboration with partners such as private, public and not-for-profit organizations for program delivery*
- *Be a direct install program*
    - *Provide a turnkey solution from the perspective of the participant such that the participant deals with one entity for the program which coordinates all elements of delivery*
    - *Emphasize deep measures that may include, where applicable, energy efficiency, demand response, fuel-switching, customer based generation and renewables*
    - *Provide an education and training strategy*
        - *Encourage behaviour change of program participants toward a culture of conservation*
        - *Help low-income energy consumers help themselves*
        - *Help program participants to understand the benefits of participating in the low-income DSM program and conservation, in general*
        - *Help channel partners attain necessary skills*
    - *Provide on-going measurement of results, feedback and accountability for continuous improvement of the program and identification of best practices*
        - *Design programs that encourage persistence of energy savings*
    - *Ensure that incentives for utilities are adequate for success*
    - *Have a DSM framework that strikes an appropriate balance between having a stable framework and having the flexibility to respond to changing market conditions*
        - *Be comprised of multi-year programs*
        - *Allow for appropriate capacity building within the gas utilities and in the marketplace.*

[8] These criteria are for the low-income energy conservation program and do not apply to the low-income emergency financial assistance program or any other program.
[9] The integrated approach could be expanded to include resource conservation (e.g. water).

OSEA also suggests that for municipally owned social housing and private sector rental housing, the performance based approach to conservation, could be used to establish performance standards to enable the constructive and orderly adoption of suite metering in multi-unit residential buildings.

***Concentric Recommendation 6*: Finally, Concentric recommends that the Board apply the cost effectiveness test on a program basis rather than a portfolio basis.**

OSEA Comment: OSEA disagrees. OSEA prefers a portfolio basis for applying the Societal Cost Test, but recommends the use the Participant Cost Test rather than the Program Administrator Cost test as input to assemble the portfolio of DSM programs. OSEA would prefer to see the companies develop multiyear plan with a strategic blend of programs that reflect customer needs, market opportunities and economic conditions.

***Concentric Recommendation 7*: Although the utilities have expressed concern that applying the cost effectiveness test on a program basis discourages them from pursuing more innovative technologies, Concentric believes that concern can be addressed through approval of special funding for research and development efforts (similar to what is done in Minnesota) and for pilot programs that may not have benefit/cost ratios greater than 1.0, as long as the Board has an opportunity to review the success of those programs within two or three years.**

Notwithstanding OSEA's response to recommendation #2, OSEA agrees that this approach to funding for R&D and pilots is appropriate, but it should also be extended to multi-year efforts to avoid lost opportunities such as new construction and performance based conservation.

OSEA also suggests that utility participation in and sponsorship of a performance based approach to conservation recognizes and enables the milestones inherent in that approach and provides both O&M budgets to do so as well as progress payments on shareholder savings for success in achieving those milestones.

III. COMMENTS ON AVOIDED COSTS

***Concentric Recommendation 8*: Concentric recommends that gas distributors should be responsible for calculating avoided costs and submitting them to the OEB for approval. Concentric endorses the Board's current approach whereby the commodity cost is updated on an annual basis, and all other avoided costs are based on a three-year program cycle. This appears to strike the proper balance between including current information for commodity costs, which tend to be volatile, while holding constant those costs which do not tend to change as frequently.**

OSEA Comment: Agreed, but there is no reason not to move to a longer cycle, such as 5 years, for Gas DSM Plans.

<u>Concentric Recommendation 9</u>: Concentric recommends that the OEB consider innovative approaches to the DSM framework, including using the avoided costs associated with renewable energy resources, reducing the discount rate to place more value on savings that are expected to occur in future years, placing a monetary value on the reduction in carbon emissions that is achieved due to energy efficiency programs, and extending the effective useful life of certain DSM measures to capture the actual savings that are realized as a result of those measures.

OSEA Comment: OSEA fully agrees and goes one step further, that both gas and electric LDC's should have the flexibility to deliver energy services to consumers making full use of the range of "green" technologies available. While gas distributors are not in the best position to become generators of electricity, many of their skills and business processes can be readily applied to other green technologies. For assistance, OSEA provides the following listing of technologies for consideration for gas distributors. In fact, OSEA supports the statements by Concentric that gas companies have the potential to become integrators for customers with respect to the delivery of multiple energy services.

Solar energy can be applied in many ways, including to: Heat and cool air by using solar chimneys; Heat buildings, directly, by designing the building to harness passive solar building design; Heat foodstuffs, through solar ovens; Heat water or air for domestic hot water and space heating needs using solar-thermal panels; and solar air conditioning.

Liquid biofuel: Agriculturally produced biomass fuels, such as biodiesel, ethanol and bagasse (often a by-product of sugar cane cultivation) can be burned in internal combustion engines or boilers. Typically biofuel is burned to release its stored chemical energy. Research into more efficient methods of converting biofuels and other fuels into electricity using fuel cells is an area of very active work. Liquid biofuel is usually either a bioalcohol such as ethanol fuel or a bio-oil such as biodiesel and straight vegetable oil. Biodiesel can be used in modern diesel vehicles with little or no modification to the engine and can be made from waste and virgin vegetable and animal oil and fats. Virgin vegetable oils can be used in modified diesel engines. In fact, the diesel engine was originally designed to run on vegetable oil rather than fossil fuel. A major benefit of biodiesel is lower emissions. The use of biodiesel reduces emission of carbon monoxide and other hydrocarbons by 20 to 40 per cent.

Solid biomass: Solid biomass is mostly commonly usually used directly as a combustible fuel, producing 10-20 MJ/kg of heat. Its forms and sources include wood fuel, the biogenic portion of municipal solid waste, or the unused portion of field crops. Field crops may or may not be grown intentionally as an energy crop, and the remaining plant by-product used as a fuel. Most types of biomass contain energy. Even cow manure still contains two-thirds of the original energy consumed by the cow. Energy harvesting via a bioreactor is a cost effective solution to the waste disposal issues faced by the dairy farmer, and can produce enough biogas to run a farm. Wood and its by-products can now be converted through process such as gasification into biofuels such as wood gas, biogas, methanol or ethanol fuel; although further development may be required to make these methods affordable and

practical. Sugar cane residue, wheat chaff, corn cobs and other plant matter can be, and are, used quite successfully.

Biogas: Biogas can be produced from current waste streams, such as paper production, sugar production, sewage, animal waste and so forth. These various waste streams have to be slurried together and allowed to naturally ferment, producing methane gas. Converting current sewage plants into biogas plants can do this. When a biogas plant has extracted all the methane it can, the remains are sometimes more suitable as fertilizer than the original biomass. Alternatively, biogas can be produced via advanced waste processing systems such as mechanical biological treatment. These systems recover the recyclable elements of household waste and process the biodegradable fraction in anaerobic digesters. Renewable natural gas is a biogas that has been upgraded to a quality similar to natural gas. By upgrading the quality to that of natural gas, it becomes possible to distribute the gas to the mass market via a gas grid.

Geothermal energy: Geothermal energy is obtained by tapping the heat of the earth itself. The International Energy Agency classifies geothermal power as renewable. GeoExchange is the industry's term used to describe an alternative to traditional oil- gas- or coal-fired heating, ventilation and air conditioning (HVAC) systems. GeoExchange systems have also been referred to as earth energy systems, or geothermal heat pump systems. This heat 'exchange' between the ground and the building is accomplished by using standard pump and compressor technology.

Clean Distributed Energy: District heating and cooling; Combined heat and power (Combined heat and power systems use the excess heat generated during the normal production of electric power. The heat can be used for a variety of applications, including process heating at an industrial site, to heat air and water, or to generate additional electricity (cogeneration) with a steam generator); Local generation that uses presently wasted energy from industrial plants; Micro grids within local distribution companies, including private wires and pipes in local geographic areas; Geothermal and atmospheric energy; Recycled exhaust heat from gas pipeline compressor stations and Energy produced on site with low pressure sources of natural gas.

***Concentric Recommendation 10*: Rather than using the utility's weighted average cost of capital as the discount rate, the Board might consider adopting a societal discount rate similar to those in Iowa and Wisconsin, which could be based on the average yield on the Government of Canada long bond over a specified number of months. This would place more value on savings that are projected to occur in future years, and would give utilities an incentive to pursue DSM measures with longer lasting benefits.**

OSEA Comment: OSEA agrees with the concept of using a societal discount rate.

***Concentric Recommendation 11*: The Board could require utilities to assign a value to certain environmental benefits such as reduced carbon emissions. Under this approach, it would be necessary for the Board to either establish the value of carbon emissions or seek guidance**

from an outside expert, the regulated utilities, or the federal or provincial government in establishing the value of carbon emissions. Once a carbon price is determined, the Board could then direct gas distributors to include that value in their avoided cost calculations. Based on Concentric's survey of other jurisdictions, a price in the range of $15/ton to $25/ton would be consistent with the value placed on carbon emissions elsewhere.

OSEA Comment: OSEA agrees that environmental externalities should be included. The Ontario government conducted a study of the health and environmental impacts of coal generation. Until coal is phased out, the externalities estimated in that study can be used. Until such time as the value of carbon and the market instruments are more certain. Such an approach does not have to include monetizing carbon credits. They should be left with the customer to pursue whatever market instruments evolve under Ontario's approach to carbon reduction.

Concentric Recommendation 12: Concentric recommends that, if the OEB determines that it wishes to assign an economic value to avoided carbon emissions, the issue may require further research and analysis in order to ascertain a more accurate and precise value based on the expected form of carbon regulation in Ontario.

OSEA Comment: The Ontario government has already conducted a study of the health and environmental impacts of coal generation. Until coal is phased out, OSEA suggests that the externalities estimated in that study can be used until such time as the value of carbon and the instruments.

IV. COMMENTS ON INPUT ASSUMPTIONS

Concentric Recommendation 13: Concentric endorses the Board's current approach of developing a common set of input assumptions with the assistance of an independent consultant. However, if the gas distributors wish to deviate from these input assumptions, we believe that they should be allowed to file information that would support their assumptions.

OSEA Comment: OSEA agrees that for programs that continue to use a "measure" x "savings" x "participant" formula, common input assumptions make sense as long as matters of climate, etc. are addressed. However, OSEA recommends that a performance based approach to conservation would rely less on product specific incentives, or at the very least, ensure that they are applied with performance based framework.

Concentric Recommendation 14: The Board should continue to update input assumptions to reflect the best available information based on the Evaluation Reports. This practice is consistent with the approach taken by the majority of other jurisdictions in our research survey. The advantage of this approach is that the Board will be better able to measure programs success against policy objectives when input assumptions are updated frequently. Another advantage is that the Board will be relying on the best available information for purposes of determining the lost revenue adjustment mechanism and the financial incentive for the utility. The primary disadvantage to frequent updates of input assumptions is cost. However, since the OEB has significant experience with DSM programs, Concentric would

anticipate that the majority of changes to input assumptions would be refinements rather than major overhauls. Therefore, we would not expect the cost of frequent updates to be as significant in Ontario as it might be for a less mature DSM framework. Further, the information gathered from the annual Evaluation Reports should be very useful in making minor revisions to input assumptions based on empirical evidence, especially on issues such as free ridership.

OSEA Comment: OSEA agrees conceptually that updated input assumptions apply to lost revenue adjustments, but points out that the revenue tracker can be more straightforward. With respect to shareholder incentives, the companies should not be at risk for changes in assumptions, particularly those developed by an independent consultant.

V. COMMENTS ON ADJUSTMENT FACTORS

Concentric Recommendation 15: Concentric believes that our recommendation to focus on market penetration of DSM technologies reduces the importance of adjustment factors in Ontario because market penetration is more readily measured than consumer behavior. However, there will continue to be concerns about whether that market penetration is the direct result of energy efficiency and conservation programs, or whether it would have occurred regardless of those efforts.

OSEA Comment: It is OSEA's position that the "measure" x "savings" x "participant" type program may be subject to greater uncertainty with respect to the need for adjustment factors, but submits that the performance based approach to conservation will provide better information on actual market conditions, consumer behavior and market penetration of new technologies.

Concentric Recommendation 16: Concentric believes there is merit in simplifying the controversy over free ridership by either assuming that free ridership is offset by spillover, unless a specific program can be reliably shown to deviate from this assumption, or by multiplying reported energy savings by a designated factor (e.g., New York uses 90%) to adjust for effects that are not attributable to DSM. However, if the Board determines that it would like to include free ridership as an input assumption, then we agree with Navigant Consulting that this would be best accomplished by relying on empirical data from the program evaluation reports, or by relying on evidence from other similar jurisdictions as it becomes available.

OSEA Comment: Again, it is OSEA's position that the "measure" x "savings" x "participant" type program may be subject to greater uncertainty with respect to either free riders or spillover, but submits that the performance based approach to conservation lessen the need for such concerns or this level of detail and debate.

Concentric Recommendation 17: Attribution of benefits is another controversial adjustment factor because it is very difficult to assign credit for energy savings. Concentric is concerned that the centrality principle currently used by the OEB gives too much credit to gas

distributors for DSM programs. Concentric recommends that, rather than attributing 100% of the benefits to gas distributors that satisfy the centrality principle, as the default, the utilities should provide evidence supporting any percentage greater than that actually spent by the utility. Otherwise, the OEB should assign a percentage of credit to the utility based on the percentage of total dollars they spent on designing, developing and delivering the joint DSM programs in question. We believe this would more equitably attribute benefits to gas distributors than under the existing DSM framework.

OSEA Comment: Again, it is OSEA's position that the "measure" x "savings" x "participant" type program may be subject to greater uncertainty with respect to attribution, but submits that gas utility sponsorship of sector specific performance based approaches could provide a sound basis for attribution as well as better coordination with electricity distributors as well as other "conservation program agents" in Ontario.

Concentric Recommendation 18: Concentric agrees that persistence should not be assumed at 100%, as in the current DSM framework. We recommend that persistence be determined from the technical input assumptions and the annual evaluation reports. If gas distributors wish to deviate from the level of persistence established in the evaluation reports, they should be required to file evidence with the Board to support a different adjustment factor.

OSEA Comment: Again, it is OSEA's position that the "measure" x "savings" x "participant" type program may be subject to greater uncertainty with respect to persistence, but submits that the performance based approaches could provide a sound basis for persistence. E.g. under such approach, building owners and managers would have the opportunity to manage persistence whether savings originated from improved technology, consumer behavior, better maintenance or recommissioning.

Concentric Recommendation 19: Finally, in their DSM plans, utilities tend to use a useful life that for certain DSM measures that is shorter than the actual engineering life, which may understate the long-term benefits of these measures. In response, the Board might consider extending the useful life of certain DSM measures in order to more accurately reflect the actual savings produced by those technologies. For example, the Board might explore extending the useful life of replacement windows, attic insulation and new building envelopes because the future benefits for those measures may have been understated.

OSEA Comment: Again, it is OSEA's position that the "measure" x "savings" x "participant" type program may be subject to greater uncertainty with respect to useful life but submits that the performance based approaches could provide a sound basis for persistence.

VI. COMMENTS ON DSM PROGRAM DESIGN

Concentric Recommendation 20: Concentric agrees with the previously-referenced NRRI publication, which indicates that DSM programs should be aligned with identified energy savings opportunities or "behavioral" problems in the market. DSM programs should be designed to emphasize those measures and technologies that contribute most to cost

effective energy savings. Another guiding principle for regulators that was articulated in the NRRI publication was that the utility should prioritize its DSM programs based on which programs are expected to produce the most cost effective results. This suggests that program design should be influenced, to some degree, by the cost effectiveness of each individual program, as well as by whether the program addresses an identified savings opportunity or a recognized behavioral problem.

OSEA Comment: OSEA asserts that this approach is too narrow to be used as the basis for program design. While recognizing that both opportunities and behavioral problems in the marketplace are critical inputs to good program design, a focus on technological intervention without due consideration for the full range of factors beyond technology that affect energy consumption is setting up conditions where every time technologies change, a utility will have to provide incentives for its adoption. What should be a key element of program design is how to create a framework for increased understanding and accountability for energy use including but not limited to selection of technology. Furthermore, the portfolio should address the mix of programs that produce the **most results that are cost effective**. This is not the same as the most cost effective results, i.e., cream skimming.

Concentric Recommendation 21: Concentric recommends that the Board utilize energy efficiency potential studies from Union and Enbridge as an indicator of which DSM programs are most likely to achieve the highest energy savings because they are aligned with documented opportunities to reduce gas consumption.

OSEA Comment: OSEA agrees that energy efficiency potential studies and other market research reports assist in good program design, but submits that a performance based approach to conservation would better address the matter of estimating potential and finding the programs that will achieve the most energy savings than the current paper based approach.

Concentric Recommendation 22: Concentric recommends that the Board utilize a combination of customer and vendor surveys to estimate the effectiveness of these programs, with the understanding that precise estimates of savings from market transformation programs are not attainable.

OSEA Comment: Customer and vendor surveys can be useful in process evaluation and be helpful in gathering data for a scorecard approach to measuring market transformation. A performance based approach could provide a more transparent indication of program effectiveness with respect to energy savings.

Concentric Recommendation 23: Distributors should be encouraged to pursue lost opportunity markets when they become available by including the achieved program results in the calculation of the financial incentive, and the Board should allow the distributor to modify its current DSM plan in order to pursue these opportunities.

OSEA Comment: OSEA agrees.

<u>Concentric Recommendation 24</u>: Concentric recommends that gas distributors and the Board continue to explore ways to address this concern because we believe that DSM programs for low-income consumers represent an important component of an effective DSM policy.

OSEA Comment: OSEA agrees and prefers that the Board proceed with the approach developed by the Low Income Energy Assistance working group in the summer of 2009. For municipally owned social housing and private sector rental housing, the performance based approach to conservation, could be used to establish performance standards to enable the constructive and orderly adoption of suite metering in multi-unit residential buildings.

<u>Concentric Recommendation 25</u>: Concentric concludes that DSM programs for low-income customers should follow several guiding principles. First, the utility should identify geographic regions with the highest concentration of low-income customers. Second, the utility should primarily focus on those customers with the highest energy use and those who have a history of late payments or face disconnection. Third, in order to capture economies of scale, the utility should develop programs that serve an entire neighborhood, rather than an individual customer. Fourth, the utility should concentrate on DSM programs that provide immediate and long-term benefits, such as home weatherization and appliance replacement. Fifth, the utility should coordinate with community organizations and local contractors to modify consumer attitudes and behaviors through education. Finally, the utility should understand that serving the low-income or disabled population requires a grassroots, community-based effort.

OSEA Comment: While OSEA agrees with the second recommendation herein, OSEA disagrees with the geographic approach, suggesting such an approach may be of greater value in locations in the United States, but as a general principle, Ontario distributors should not be limited to geographic targeting. Ontario has a stronger record of integrating low income housing within its towns and cities. However, OSEA, which has a strong affinity for the concept of communities, we do not believe that communities are defined by geography. Low income participation in programs should be based on a more proactive and sophisticated intake process to avoid lost opportunities. In Ontario, there are three major types of low income housing: social housing, private sector rentals and low income home owners. In 2006, IndEco Strategic Consulting provided a report[10] to the Ontario Power Authority recommending approaches to each segment. These recommendations remain valid and should be pursued in conjunction with a performance based approach to conservation.

[10] http://www.conservationbureau.on.ca/Storage/14/1930_Low-income_program_concepts_for_Conservation_Bureau.pdf

VII. COMMENTS ON DSM BUDGET

Concentric Recommendation 26: ***As noted in Table 4, Ontario's 2007 Action Plan for Climate Change establishes targets for aggressive reductions in greenhouse gas emissions by 2020. In 2007, natural gas accounted for 26% of GHG emissions in Ontario. If gas distributors are to contribute toward a reduction in GHG emissions, then more spending on DSM will almost certainly be necessary. At the same time, there is increased commitment to using renewable energy and natural gas to generate electricity in Ontario. Concentric observes that these changes require gas distributors to continuously re-think how they approach resource planning and how they serve customers. It is important for the Board to implement a DSM framework that provides gas distributors with sufficient funding to develop and deliver energy efficiency programs that meet these policy objectives, while ensuring that the programs are cost effective and do not place undue pressure on customer rates.***

OSEA Comment: OSEA agrees but, emphasizes that the Board should be more concerned with customer bills than rates.

Concentric Recommendation 27: ***In order to achieve more aggressive energy efficiency and conservation targets, Concentric concludes it will be necessary to increase spending on DSM programs in Ontario. As noted earlier in Tables 13 and 14, the average Canadian gas distributor spent approximately 2.0% of utility revenues less the cost of purchased gas on DSM programs in 2007, while the average U.S. gas distributor in our sample spent approximately 3.9% in 2008. Enbridge and Union both spent somewhat more than the average Canadian gas distributor in 2007, at 2.26% and 2.60% respectively. However, these percentages are well below the average spending among the U.S. gas distributors in our sample, and significantly below the gas utilities which spend the highest percentage of utility revenues on DSM – Manitoba Hydro (7.11%), Southern California Gas (5.40%), CenterPoint Minnesota Gas (5.93%) and Cascade Natural Gas (8.21%).***

OSEA Comment: While OSEA agrees that additional resources will be required to achieve more aggressive targets, OSEA rejects the notion of a fixed rate of spending, particularly if a performance based approach to conservation is used. In any case, distributors should build their first budget under new guidelines from the bottom up rather than require them to spend a set amount or share of net distribution revenues.

Concentric Recommendation 28: Concentric recommends that the OEB consider establishing a minimum percentage of utility revenues[81] that gas distributors would spend on DSM programs, as well as a range of Board-recommended percentages that encourages gas distributors to pursue innovative or aggressive DSM measures. Concentric recommends a minimum annual budget threshold of 3.0% of utility revenues less the cost of purchased gas, and a Board-recommended range between 4.0% and 6.0%. Some of the relevant parameters for establishing this recommended range might include: 1) achieving a long-term Societal Cost Test equal to 1.0; 2) achieving market penetration of 90% for the Best Available Technologies for mass market DSM measures, and 3) contributing toward achieving any

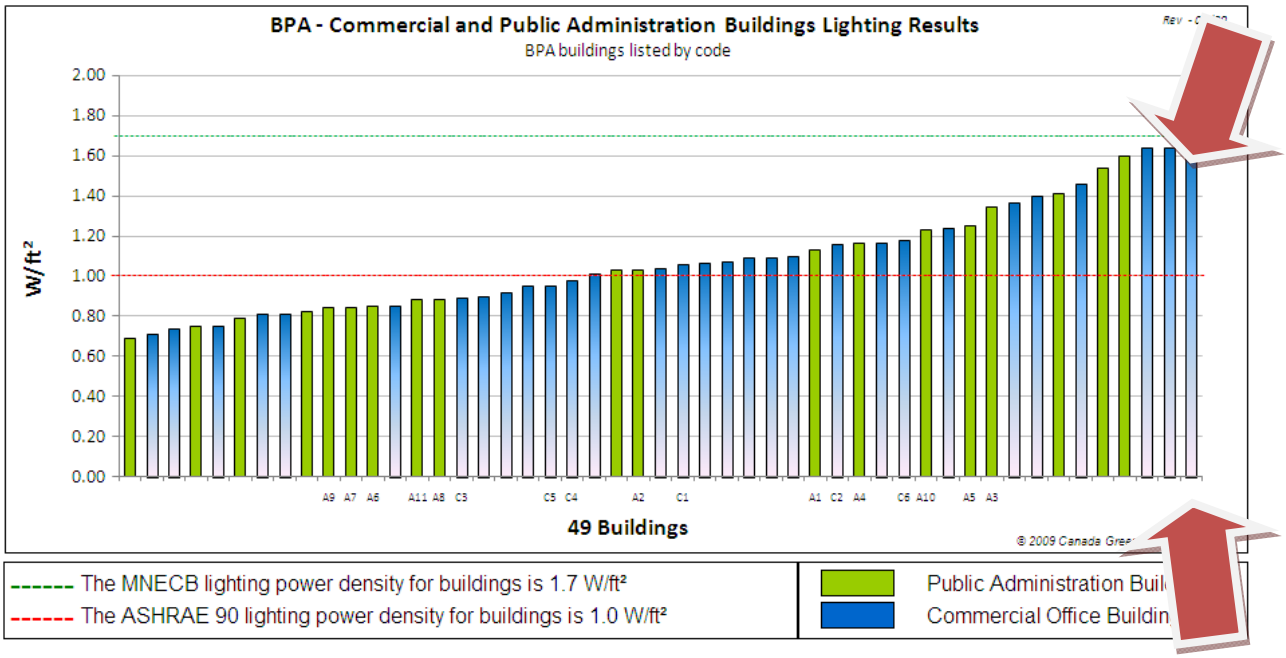
carbon reduction targets that are established as a result of the Green Energy Act or similar future legislation.

OSEA Comment: While OSEA agrees that additional resources will be required to achieve more aggressive targets, OSEA rejects the notion of a minimum rate of spending.

VIII. COMMENTS ON DSM METRICS/TARGETS (MEASURING SUCCESS)

<u>Concentric Recommendation 29</u>: Concentric recommends that the Board adopt market penetration of the Best Available Technologies as its primary metric for evaluating whether a particular DSM program or measure is successful. In situations where market penetration is not applicable or cannot be measured (e.g., attic insulation might be difficult to observe), Concentric recommends measuring the reduction in gas consumption per customer attributable to the DSM program or measure. The market penetration metric would require gas distributors to establish a baseline of the existing circumstances in Ontario for each energy efficiency and conservation measure by conducting an inventory assessment. Once this work is completed, the OEB would be able to measure program success by establishing market penetration targets for each specific energy efficiency measure by a certain date. For example, the Board might determine that it wishes to set a target of 75% market penetration for installation of the best available replacement windows by 2020, or a 60% market penetration for installation of the most efficient gas furnaces by 2025. These percentages would depend on several factors, including the results of the inventory assessment that establishes the baseline for each measure, any specific metrics the Board may set regarding reductions in per capita gas consumption, and any carbon emission reduction targets that may be promulgated as a result of the Green Energy Act. Concentric recommends that the Board consider establishing long-term market penetration targets that cover three to five years, and require the gas distributors to propose how to achieve these targets in their DSM plan filings.

OSEA Comment: OSEA disagrees with the notion that the concept of Best Available Technologies (BAT) is relevant to demand side management. Assuming that applying the best available technologies alone delivers the expected savings or delivers enough savings to satisfy Ontario's carbon reduction targets is a mistake. One need only look to the recent report by REALpac (Appendix A) to see the impact of such an assumption in program design.



"We thought we were doing the right thing retrofitting from T-12 to T-8 lighting until we found our building at the right hand end of the chart. Now we know we have to redesign, not just replace fixtures," said a CaGBC Pilot Project Participant upon discovering that his building was on the far right after a retrofit paid for by a conservation program added electricity load. Had he not just changed technology but specified a reduced wattage per square foot, he would have seen savings. Not only did the conservation program administrator pay an incentive was three times greater than necessary, the building manager paid for more lights that was needed and will pay higher energy bills.

<u>Concentric Recommendation 30</u>: Concentric recommends that the Board strongly encourage gas distributors to focus on DSM programs which have the highest potential for increasing market penetration of BAT. By concentrating on market penetration, Concentric believes the Board can more accurately measure and evaluate the success of DSM programs. Once it has been determined that end-use applications are in the public interest, it is more straightforward to monitor penetration of those applications. This approach will result in the selection of DSM programs that maximize the economic potential of energy efficiency and conservation programs, rather than simply passing a minimum benefit/cost threshold of 1.0.

OSEA Comment: OSEA disagrees and urges the Board to consider the performance based approach to conservation.

Concentric Recommendation 31: Concentric believes that similar metrics could be developed for its DSM programs serving low-income customers. Market penetration and the reduction in gas consumption per customer appear to be equally appropriate for this customer segment. However, the targets might be different for certain programs and measures. For example, the Board may want to establish a higher market penetration standard (perhaps 90%) for home weatherization of low-income properties to ensure that energy savings is maximized.

OSEA Comment: OSEA disagrees and prefers that the Board proceed with the approach developed by the Low Income Energy Assistance working group in the summer of 2009. Subsequently, if the approach described in OSEA's response to Issue 14 is adopted, such an approach could be applied to many segments of the low income consumer group.

IX. COMMENTS ON FINANCIAL INCENTIVE (UTILITIES)

Concentric Recommendation 32: Concentric recommends that the financial incentive mechanism be primarily tied to the success of the gas distributor in achieving pre-determined market penetration levels for each DSM technology.

OSEA Comment: OSEA disagrees and urges the Board to consider developing incentives based the performance based approach to Conservation.

Concentric Recommendation 33: Further, Concentric recommends that the Board set metrics and targets for gas distributors so that they are incented to pursue DSM measures that provide deep energy savings.

OSEA Comment: OSEA agrees.

Concentric Recommendation 34: Concentric recommends that the Board develop an incentive formula that considers the magnitude by which the gas distributor exceeds certain metrics or targets, including market penetration, reduction in gas consumption, and/or contributions toward reductions in carbon emissions.

OSEA Comment: OSEA disagrees and urges the Board to consider developing incentives based the performance based approach to Conservation.

Concentric Recommendation 35: Concentric recommends that gas distributors should not be eligible to receive financial incentive payments if they do not exceed the established DSM metrics and targets for each program (i.e., resource acquisition, market transformation, and low income), whether it be for market penetration, energy savings, or carbon emission reductions. Concentric does not believe that gas distributors should be rewarded for achieving less than 100% of program success. Conversely, we do not believe that penalties for failing to achieve 100% success are advisable.

OSEA Comment: OSEA contends that the notion of a shared savings mechanism means that customers, society and distributors share the value of savings. Not rewarding distributors for achieving less than 100% of program success will likely result in "timid" targets, confounding the impact of the bulk of the proposed changes to the gas DSM framework.

Concentric Recommendation 36: For low income programs, Concentric recommends that the Board develop a separate financial incentive mechanism that is contingent on market penetration, reductions in gas consumption, and efforts to reduce customer bills through education and awareness programs for low income consumers.

OSEA Comment: OSEA agrees but prefers that the Board proceed with the approach developed by the Low Income Energy Assistance working group in the summer of 2009 plus the performance based approach to conservation.

Concentric Recommendation 37: When input assumptions are updated, Concentric believes that it is appropriate to use best available information for purposes of calculating the financial incentive payment. Our recommendation is based on the premise that the Board-approved input assumptions have been developed with the assistance of an expert consultant, that stakeholders have had ample opportunity to comment on those input assumptions, and that any changes for existing DSM measures will tend to be refinements. If Ontario did not already have significant experience with its DSM program, we would be more sympathetic to arguments regarding the value of "locked-in" input assumptions, so that year-to-year changes in input assumptions should be more modest.

OSEA Comment: OSEA contends that with respect to shareholder incentives, the companies should not be at risk for changes in assumptions, particularly those developed by an independent consultant.

X. COMMENTS ON COMPENSATING FOR LOST REVENUE

Concentric Recommendation 38: Concentric recommends that the Board consider providing gas distributors with the opportunity to request revenue decoupling.

OSEA Comment: OSEA believes that the draft DSM framework is sufficient with respect to lost revenue associated with both conservation and average use. If the distributors wish to request decoupling for other reasons, OSEA has no comment.

Concentric Recommendation 39: If revenue decoupling is not adopted by the Board, or until such time as it is implemented, Concentric believes that the necessary information is available to calculate the LRAM based on energy savings (which is contained within the Societal Cost test and Program Administrator Cost test) and market penetration (which is the primary metric we recommend for measuring program success). Further, if the Board continues to rely on the LRAM, Concentric recommends that the calculation should be based

on updated input assumptions. However, we agree with Enbridge that it is reasonable to establish a date by which information used to calculate LRAM must be submitted.

OSEA Comment: OSEA agrees with Enbridge.

XI. COMMENTS ON CONSERVATION IMPACT EVALUATION

Concentric Recommendation 40: Concentric recommends that the OEB appoint the entities that are responsible for conducting the independent program evaluation and the third-party audit of program results.

OSEA Comment: OSEA disagrees. Program evaluation is an important managerial function that should remain with *the companies. The current framework with a third party audit overseen by the Evaluation Audit* committee is sufficient. OSEA also notes that the performance based approach to conservation will provide even more transparency.

Concentric Recommendation 41: Concentric believes that it is appropriate for the utility to continue to pay for the program audit and the program evaluation, and to continue to recover that cost through the designated cost recovery mechanism.

OSEA Comment: OSEA agrees.

Concentric Recommendation 42: Concentric anticipates that the Board would be responsible for selecting the program evaluator(s) and the program auditor, for defining the parameters of the evaluation and the audit, and for reviewing the results. Concentric believes the Board should consider assigning one or two OEB staff members to oversee the DSM program and evaluation audit process, thereby minimizing the impact of this recommendation on the Board's limited resources.

OSEA Comment: OSEA disagrees, but suggests that a Board member could be an ex officio member of the Evaluation Audit Committee.

Concentric Recommendation 43: In selecting the third-party auditor, Concentric recommends that the OEB attempt to balance the need for expertise in verifying DSM program results with the need for independence. Certain stakeholders have expressed concern that the third-party auditor may not be truly unbiased if it typically represents the interests of regulated utilities. However, it is important to select an auditor that possesses the qualifications and expertise to evaluate and verify the reported results.

OSEA Comment: OSEA thinks that program evaluation is an important managerial function that should remain with the companies. The current framework with a third party audit overseen by the Evaluation Audit committee is sufficient.

XII. COMMENTS ON FILING AND REPORTING REQUIREMENTS

Concentric Recommendation 44: Concentric endorses the OEB's proposed annual reporting and evaluation reporting requirements. We believe that the Evaluation Report and the Annual Report, as described in the DSM Draft Guidelines, will provide the Board with the necessary information about the success of DSM programs without imposing unnecessary costs and administrative burdens on gas distributors.

OSEA Comment: OSEA disagrees requiring an annual report in addition to an evaluation report and a third party audit of the evaluation report in redundant and unnecessary.

XIII. COMMENTS ON STAKEHOLDER INPUT

Concentric Recommendation 45: Concentric endorses the OEB's current approach to soliciting stakeholder input. From our perspective, the Board's existing DSM Framework strikes the appropriate balance between allowing stakeholders the opportunity to participate in the development, design and evaluation of DSM programs while recognizing that gas distributors are ultimately responsible and accountable for these programs.

OSEA Comment: OSEA suggests that that the current stakeholders engaged in the consultative process with the gas distribution utilities play a valid role in the evaluation process, but develop and design of DSM programs requires much broader consultation beyond a regulatory framework to engage trade allies, NGOs, other energy provides, etc. This process should not be prescribed by regulations or guidelines, but rather recognized as a valid input to program design and be included in distributor DSM budgets. Doing this function well will result in more savings; potentially limiting program design inputs to the current intervenors is unnecessary.

XIV. COMMENTS ON INTEGRATION OF GAS/ELECTRIC

Concentric Recommendation 46: The Board might wish to encourage utilities to integrate certain phases of their DSM programs, such as program delivery (e.g., home energy audits) or low-income community programs. Home energy audits offer a significant opportunity for cost synergy because the potential for both natural gas and electric savings can be assessed in the same visit.

OSEA Comment: OSEA agrees and suggests that the performance based approach to conservation would provide a creative and useful framework for such co-operation including the involvement of other program providers.

Concentric Recommendation 47: Concentric recommends that the Board consider ways in which gas and electric utilities can coordinate, if not integrate, their DSM programs to improve customer participation and to achieve certain administrative efficiencies.

OSEA Comment: OSEA agrees and suggests that the performance based approach to conservation would provide a creative and useful framework for such co-operation including the involvement of other program providers.

<u>Concentric Recommendation 48</u>: We further believe that DSM programs for low-income customers that are implemented on a community basis provide a unique opportunity for cooperation between gas and electric utilities to capture synergies in communications and delivery of programs. Pilot programs on an individual community basis represent an appropriate start to such an initiative.

OSEA Comment: Subject to the concerns raised in Issue 25, OSEA agrees and suggests that a performance based approach to conservation would provide a creative and useful framework for such co-operation including the involvement of other program providers.

APPENDIX A

Table 1: Possible Regulatory Approaches to DSM

	Element	Traditional	Progressive	Aggressive
	Primary Objective	***Energy Savings***	***Energy Savings*** ***Manage Demand Growth***	***Energy Savings*** ***Manage Demand Growth*** ***Carbon Reduction***
1.	**Cost Effectiveness Test**	Ratepayer Impact Utility Cost	TRC	Societal Modified TRC
2.	**Avoided Costs**	Commodity	Commodity Capacity	Commodity Capacity Externalities Carbon reduction
3.	**Input Assumptions**	Utility costs	Utility costs, participant costs	Utility costs participant costs Externalities
4.	**Adjustment Factors**	Free ridership Persistence Attribution	Plus free drivership Spillover Proportional attribution	Secondary concern (tradeoff theory)
5.	**DSM Program Design**	Prescriptive	Flexible	Proportional reduction
6.	**DSM Budget**	Fixed $ Amount	% of Revenues	Objective/target Driven
7.	**DSM Metrics** **Targets** **(Measuring Success)**	Energy Saved/DSM $	Short term and long term energy savings	Long term energy savings Market Transformation DSM Penetration Carbon Reduction
8.	**Financial Incentive (Utilities)**	Limited	Tied to Energy Savings	Tied to Societal Goals/Climate
9.	**Compensating for Lost Revenue**	Minimal	LRAM	Revenue Decoupling
10.	**Conservation Impact Evaluation**	Utility report, prudence review	Independent review and verification	Evaluate whether DSM results achieve program objectives
11.	**Filing and Reporting**	Progress Report Evaluation Report	Audited Program Results	Broad Evaluation Measures
12.	**Stakeholder Input**	Limited/Informal	Formal/Advisory	Proactive Consultation Direct Involvement
13.	**Integration of Gas/Electric**	Limited/None	Encouraged	Mandated
14.	**Alternative DSM Framework(s)**			

APPENDIX B:

Attach Real Pac report 20 by ‘15 - Achieving the Office Building Target of 20 ekWh/ft2/year by 2015

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20 BY '15

20 by '15

Achieving the Office Building Target of

20 ekWh/ft^2/year by 2015

REALpac
Real Property Association of Canada | Association des biens immobiliers du Canada

About REALpac

REALpac, the Real Property Association of Canada is Canada's senior national real property association whose mission is to bring together the country's real property investment leaders to collectively influence public policy, to educate government and the public, and to ensure stable and beneficial real estate capital and property markets in Canada. REALpac members currently own in excess of CDN $150 Billion in real estate assets located in the major centres across Canada and include real estate investment trusts (REITs), publicly traded and large private companies, banks, brokerages, crown corporations, investment dealers, life companies, and pension funds. Visit REALpac at www.realpac.ca

About Enerlife Consulting Inc.

Enerlife Consulting is a Canadian-owned management consulting firm, based in Toronto, Canada. Enerlife provides a range of services which enable property owners and managers to achieve and sustain high levels of energy and environmental performance in their individual buildings and whole building portfolios. Visit Enerlife at www.enerlife.com

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20 by '15

Achieving the Office Building Target of 20 ekWh/ft^2/year by 2015

Executive Summary

The Real Property Association of Canada (REALpac) is adopting an energy consumption target for office buildings of 20 equivalent kilowatt-hours of total energy use per square foot of rentable area per year (20 ekWh/ft^2/year), to be achieved by 2015. In other words, " *20 by '15* ". The target represents a reduction of up to one half of today's energy use in Canadian office buildings. Achieving the target will lead to estimated energy cost savings in the order of $1.85 billion/year, and greenhouse gas emissions savings of 7.5 Megatonnes/year contributing 5% of Canada's national 2020 goal.

The REALpac target is derived from national, large-scale pilot projects conducted by the Canada Green Building Council (CaGBC) in 2008. The projects engaged more than 40 commercial office and government real property owners with 144 buildings totalling 48 million ft^2, and created a large, detailed database of Canadian office building energy performance. Audits were conducted of top-performing buildings to document their building system characteristics, leading to identification of best practice design standards. Workshops have also been conducted with participants to document best operational practices. Combining these design and operations best practices yields target energy use in the range of 16-20 ekWh/ft^2/year.

The CaGBC pilot projects produced a number of remarkable conclusions. The range between the highest and lowest office building energy users per ft^2 is more than 2.5:1. The range of lighting power density (Watts/ft2) is also more than 2.5:1 in new and retrofitted office buildings using similar technology for similar office space lighting applications. There is no apparent correlation between building age and performance – several of the top-performing buildings are more than 40 years old. A number of office buildings are already operating at or close to the REALpac target, and even top-performing buildings were shown to have room to improve.

The pilot project workshops, and the continuing engagement of many owners in CaGBC's ongoing Green Up program, have also helped clarify how individual buildings and portfolios can work towards achieving the target. The common perception has been that improving energy efficiency in buildings is all about technology, retrofitting and capital expenditure. The emerging new understanding is that policy, process and people are in fact at the heart of achieving and sustaining high levels of energy efficiency and deep reductions in greenhouse gas emissions. Financial returns should be greater than has previously been

expected, but significant organizational change is required to align policy, management, leasing, procurement, and HR programs with the demands of consistent energy efficient practice.

A roadmap is presented for achieving and sustaining high levels of energy performance in individual buildings and portfolios. The roadmap begins with benchmarking, and works through to performance monitoring, feedback and continuous improvement. Canada's real estate industry is positioned to have a meaningful impact on the climate change mitigation agenda, through both its own potential to demonstrate greenhouse gas emission reductions, and the example it can provide. The methodology, metrics, standards and tools described in this paper did not exist a year ago. The commercial office sector and government real property departments have shown leadership, through their participation in the CaGBC pilot projects, in both substantiating the opportunity for deep cuts in energy use and emissions, and developing the means to achieve and sustain them. REALpac's " *20 by '15* " target takes this leadership to the next level.

20 by '15

Achieving the Office Building Target of 20 ekWh/ft^2/year by 2015

1. THE TARGET – 20 ekWh/ft^2/year by 2015

Experience in business, education and health care has demonstrated the power of target-setting for achieving substantial improvements in important fields of endeavour. Targets set by the executive, affirmed in governance, and written into policy, clarify goals and expectations, engage and empower individuals, and align organizations.

Climate change is one of today's critical fields of endeavour. Construction and operation of buildings directly account for between 30% - 40% of greenhouse gas emissions in Canada (Canada Green Building Council). Improved energy efficiency in buildings presents an attractive policy option for addressing climate change mitigation. Concerted action promises substantial cuts in emissions while adding to economic growth, creating healthier indoor environments and renewing infrastructure. Policy-makers are aware of this potential, leading to increased adoption of energy efficiency regulations and incentives across North America.

Following extensive research and consultation, the Real Property Association of Canada (REALpac) is adopting an energy consumption target for office buildings of 20 equivalent kilowatt-hours of total energy use per square foot of rentable area per year (20 ekWh/ft^2/year), to be achieved by 2015. In other words, " *20 by '15* ".

The REALpac target includes all energy used in the operation of buildings (electricity, natural gas and other thermal energy sources) converted to the common energy unit of equivalent kilowatt hours (eKWh)[1]. As described in this paper, the target is set at a level which is attainable by following current best practices, and represents a reduction of up to one half of today's median energy use in Canadian office buildings. The target is intended as an essential first step in demonstrating substantial, sector-wide emissions reductions and operating cost savings, while taking full advantage of incentives and enabling it to get in front of potential legislation and/or regulations.

[1] For example, one cubic meter of natural gas equals approximately 10.5 eKWh

> **"20 ekWh is achievable at reasonable cost, in Canada, today. The achievement of the *20 by '15* target will show real estate as a leadership industry in Canada and the world."**
>
> **S. Michael Brooks, CEO, REALpac**

Based on the results of the Canada Green Buildings Council's (CaGBC) national pilot projects described below, achieving the target would lower median energy use for commercial office and government office buildings by 48.1% and 34.9% respectively[2]. The potential operating cost and emissions savings for Canada are summarized in Table 1.

Table 1

Office Type	Total Floor Area in Canada (millions ft²)[1]	2007 Median[2] (ekWh/ft²)	Target (ekWh/ft²)	Median Percent Reduction	Potential Operating Cost Savings[3]		Emissions Savings (MT)
					Total (millions)	($/sq ft²)	
Commercial Office Buildings	1,059	38.5	20.0	48.1%	$1,652	$1.56	6.8
Government Administration Office Buildings	311	30.7	20.0	34.9%	$199	$0.64	0.7
Totals	**1,370**			**45%**	**$1,851**		**7.5**

[1]Source: *NRCAN Commercial and Institutional Consumption of Energy Survey - Summary Report June 2007*
[2]Based on 56 commercial office buildings at ~31 million ft² and 73 government administration office buildings at ~13 million ft²
[3]Target energy costs based on: $0.10/kWh electricity, $0.39/m3 gas

2. WHY 20?

In 2008, 14 commercial office landlords took part in CaGBC's national pilot project with 64 buildings totalling 32 million ft². A parallel project for government office and administration buildings engaged Public Works & Government Services Canada, five provincial government real property departments, and 22 cities with 80 buildings totalling 16 million ft[2]. The total area of these participating buildings is equivalent to more than 25 Toronto Eaton Centres.

The CaGBC initiative has created a large, dynamic database of actual energy and water use performance for Canadian office buildings, conducted workshops and teleconferences with participants, and developed metrics, standards, tools and templates to help owners improve the performance of their buildings. Top-

[2] Government administrative office building median based on larger sample size than benchmark Figure 2, which contains only buildings with complete utility data from every year between 2005-2007.

performing buildings were identified and documented, and participants were able to assess their own buildings' performance and plan individual building improvements accordingly.

> **"We were surprised that some of our best buildings were only around the median on the benchmark charts. External benchmarking has helped us identify the potential for improvement."**
>
> **CaGBC Pilot Project Participant**

Total energy use benchmarking, for 2005 and 2007 is shown for commercial and government buildings in Figures 1 and 2 respectively. These benchmark charts are normalized for weather differences across the country by adjusting the heating portion of gas or oil use, and the air conditioning portion of electricity use by the ratios of heating and cooling degree days respectively between the Environment Canada weather station closest to the building and the Toronto City weather station.

The results are remarkable for the ranges between highest and lowest energy users (2.5:1 for commercial offices and 4:1 for government buildings), and the magnitude of savings already being recorded by many of the buildings.

Figure 1

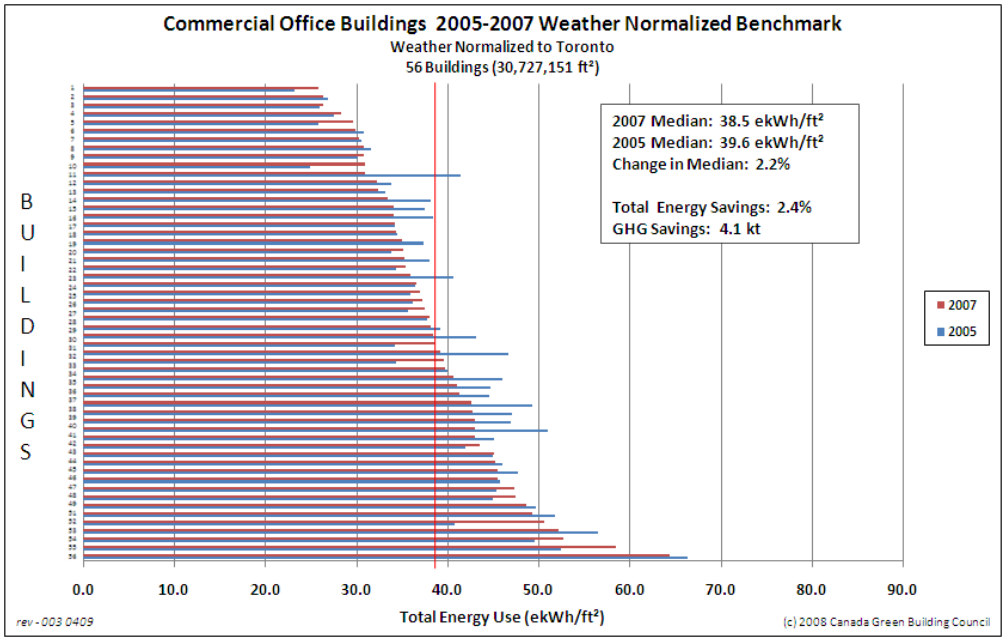
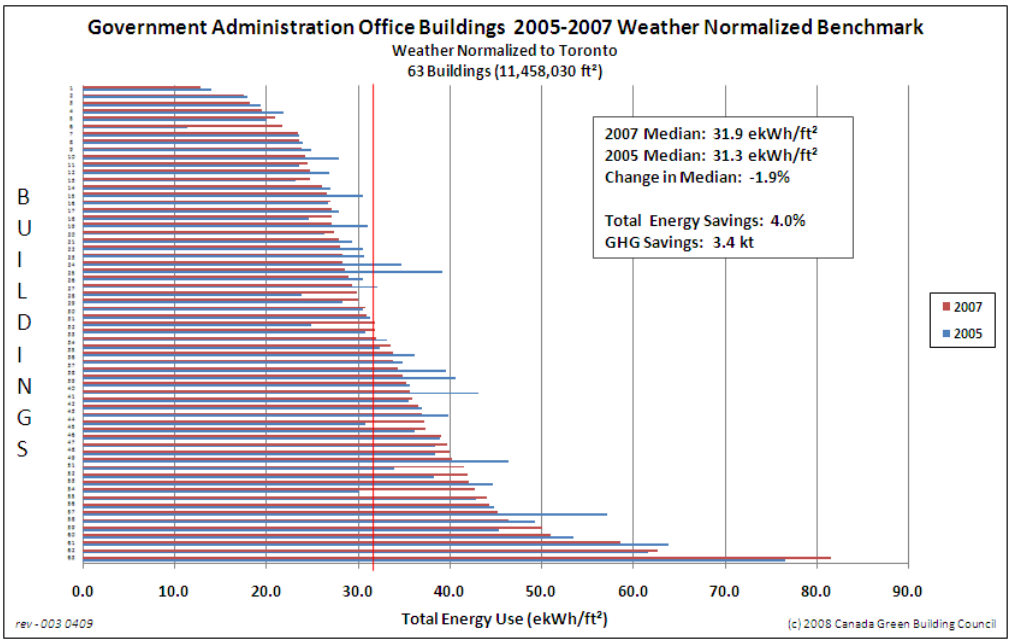


Figure 2



A normalization template was developed to account for material space, occupancy and energy source differences between buildings (such as data centres, retail space and electric heat). The template has been aligned with the U.S. Environmental Protection Agency's Portfolio Manager so that Energy Star scores can also be calculated. Normalization allowed the identification of top-performing buildings presented in Table 2. These results are interesting in a number of ways, including no apparent correlation between building age and performance, and the indicated room for further improvement in energy use components.

Table 2

2008 Commercial and Government Administration Office Building Top Performers
(Weather Normalized to Toronto Lester B Pearson Int)

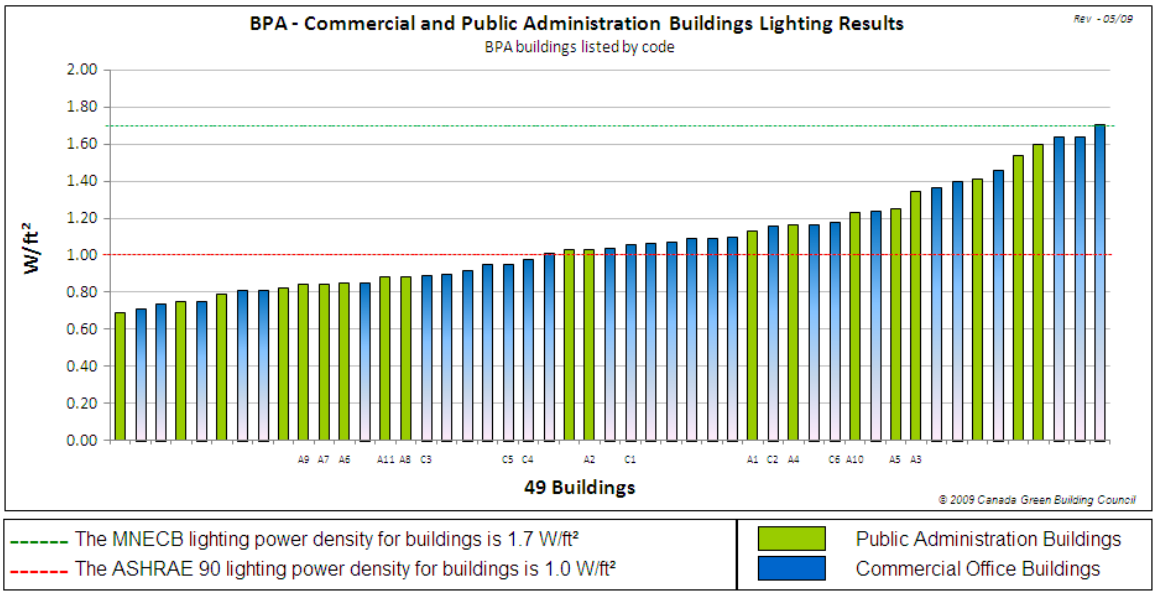
Building Characteristics				Total Energy		Electricity			Thermal
						Consumption	Demand	Load Factor	
Type	Location	Approximate Size (ft²)	Construction Decade	Space Normalized (ekWh/ft²)	Actual (ekWh/ft²)	kWh/ft²	W/ft²	Annual (hrs/day)	Consumption (ekWh/ft²)
PROV	QC	150,000	1980's	12.9	11.9	10.8	3.2	9.3	1.1*
PROV	ON	250,000	1980's	15.5	17.1	17.0	3.4	13.8	0.0*
FED	QC	200,000	2000's	17.5	17.0	15.9	2.7	16.2	1.1*
FED	ON	350,000	1930's	18.5	19.3	10.7	3.6	8.2	8.6
PROV	MB	50,000	1970's	19.5	19.2	11.1	2.8	10.9	8.1
PROV	MB	50,000	1970's	20.8	21.6	18.7	4.5	11.3	2.9*
MUNI	ON	200,000	1980's	22.0	22.0	14.4	3.2	12.3	7.7
COM	BC	200,000	1980's	22.4	25.1	19.4	4.3	12.3	5.7
MUNI	BC	200,000	2000's	22.8	21.6	14.5	-	-	7.0
COM	ON	400,000	1950's	23.7	28.5	28.2	5.4	14.4	0.3*
rev - 07/09									(c) 2008 Canada Green Building Council

** over 10% electric heat*

Note: coloured cells indicate potential for further improvement

Several of the top-performing buildings were then audited by engineering firms pre-qualified by CaGBC using a standard Building Performance Audit (BPA) template to test, document and compare design metrics such as Watts/ft^2 and plant capacity per thousand ft^2. The audit was applied to all major building systems - lighting, ventilation, heating, air conditioning, office equipment, building envelope and water fixtures – and reconciled test results with the actual electrical demand for the buildings. Figure 3 shows results for lighting, and includes buildings where participants used that part of the template themselves to see where they stood. The metrics shown for the 49 buildings are simply total installed lighting Watts on a typical floor divided by the rentable area. The remarkable findings are first the range of 2.5:1 in power density using similar technology for similar office space lighting applications, and secondly that industry good practice is substantially better than either Canada's Model National Energy Code or the current ASHRAE standard. The results also demonstrated that even the top-performing buildings have room to improve energy efficiency in one or more of their primary building systems.

Figure 3



"We thought we were doing the right thing retrofitting from T-12 to T-8 lighting until we found our building at the right hand end of the chart. Now we know we have to redesign, not just replace fixtures."

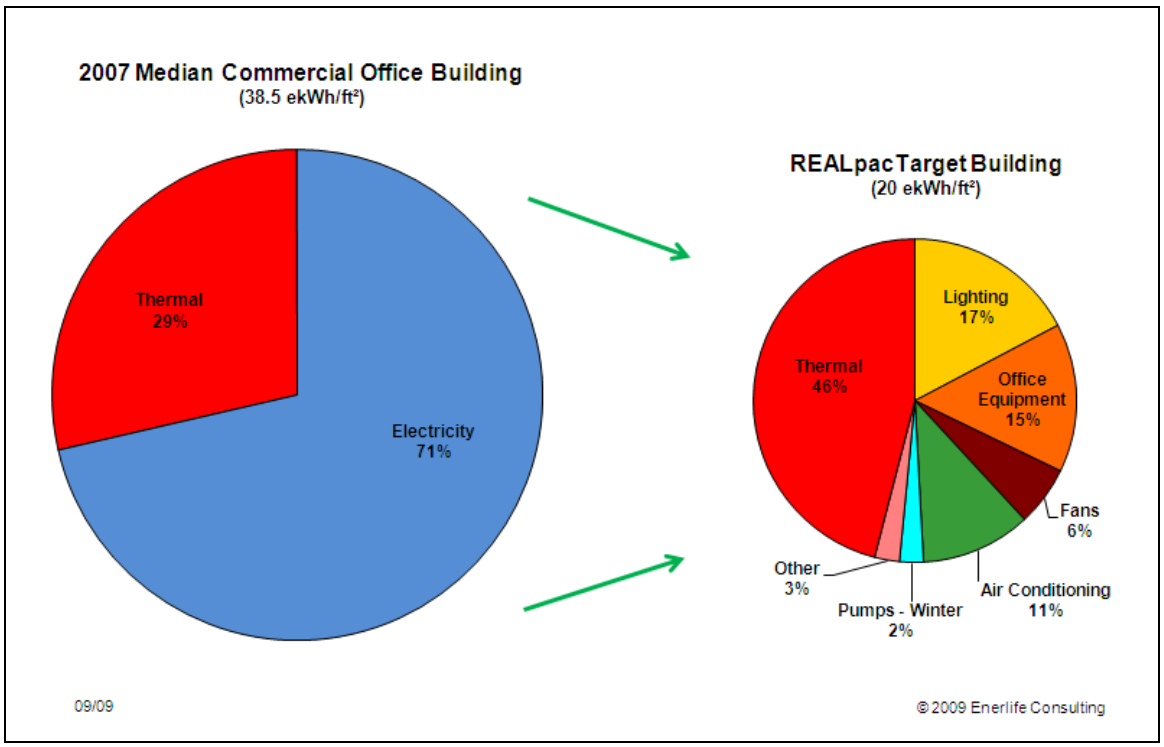
CaGBC Pilot Project Participant

"We have lowered our tenant lighting design standard from 1.1 to 0.85 Watts/sq ft based on these results from the pilot project."

CaGBC Pilot Project Participant

The results of the CaGBC pilot projects, which are being reinforced by the ongoing developments through their new Green Up initiative, are transforming the way that owners, managers and designers understand and think about the actual energy performance of buildings. Several buildings are already close to the REALpac *20 by '15* target, and even the top-performing buildings have been shown to have significant room to improve. Modelling the good practice design standards for each building system derived from the pilot project audits with typical office building occupancy periods yields total energy use in the range of 16-20 ekWh/ft²/year. Figure 4 presents the typical energy use breakdown of the 20 ekWh/ft²/year building compared with the 2007 median commercial office building.

Figure 4



In short, achieving the target requires only consistent application of good system design/retrofit standards for each building system identified through the CaGBC pilot project, together with operating periods and practices that are already in common practice.

3. GETTING THERE FROM HERE

3.1. It's Not What You Think

The common perception has been that improving energy efficiency is all about technology, retrofitting and capital expenditure. The emerging new understanding is that policy, process and people are in fact at the heart of achieving and sustaining high levels of energy efficiency and deep reductions in greenhouse gas emissions.

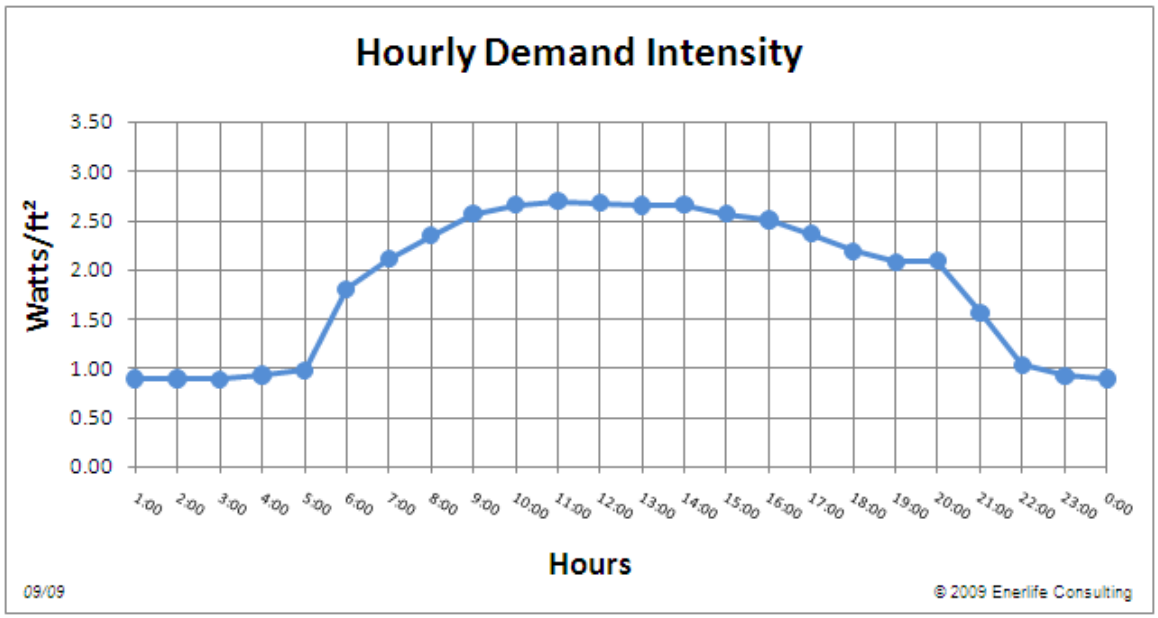
The good news is that operating cost savings should generally be greater and Capex less than had previously been expected, with higher rates of return on investments. The more challenging conclusion is that high levels of performance cannot be achieved and sustained without significant organizational change to align policy, management, leasing, procurement, and HR programs with the demands of consistent energy efficient practice. The recommended strategy for most owners and managers (which

fits well with today's capital constrained times) is to address organizational alignment first, before taking on capital retrofit projects. Introducing benchmarking, target-setting and performance monitoring into management practice builds internal capacity and confidence while generating significant savings at low cost through operational improvements and re-commissioning – getting the best out of the building as it is. With this experience, staff and service providers are then better able to contribute to defining future capital projects and ensuring their success.

3.2. A New Literacy

The foundation for addressing energy efficiency in individual buildings and portfolios is the seemingly mundane (and sometimes arcane) world of utility bills. While there is considerable room for improvement in billing reliability and clarity, unlocking the wealth of data contained in monthly utility bills is necessary for carbon reporting, and can also provide essential insight into current performance, point to areas for improvement, and verify the effectiveness of actions taken. New metering technology expands this potential. Interval meters and smart meters can provide real-time windows into daily, weekly and seasonal building operations and areas for improvement. Figure 5 shows clearly what time the building starts up and shuts down, how it is used through the day, and how much electrical load is left running all night long.

Figure 5



Sub-metering of tenants and equipment can take this performance analysis and diagnosis further still. However, effective management of the data contained in monthly utility bills remains the starting point

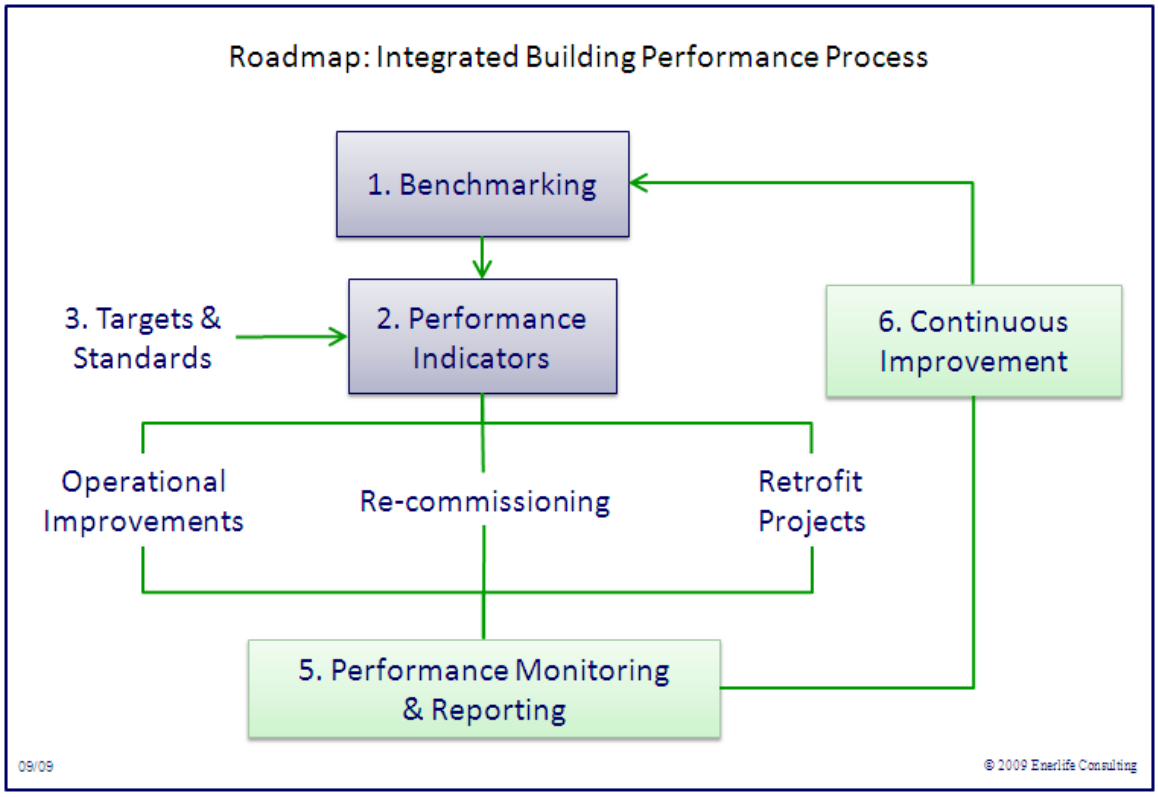
for energy performance management and carbon reporting. Similarly, building owners and managers need to become familiar with the building performance and system-level metrics developed by the CaGBC and referred to in this paper, and reflect current good standards in their specifications, leases and contracts with consultants, tenants, contractors and service providers.

This new literacy should be internalized within building owner and manager organizations in order to effectively set targets, develop strategy and plans, support good building operations, direct outside suppliers, and report on progress. It is an essential new skill in the pursuit of sustainability.

4. A ROADMAP TO 20 ekWh

Figure 6 presents the "Roadmap to 20 ekWh", which is described in the following sections.

Figure 6



4.1. Energy Use Benchmarking

It is 2009. Do you know the total energy performance of your building? Benchmarking is the starting point for addressing energy efficiency. High performance can be used by leasing agents to market a building.

Lower performance should factor into target setting and individual performance objectives. Executives should know how their properties compare with each other and with the office buildings market as a whole.

4.2. Performance Indicators

Beyond total energy use benchmarking, drilling down into component parts of energy use helps create building-specific targets, and identify which buildings are candidates for operational improvements, re-commissioning and/or retrofits. Interval meter profiles allow identification and quantification of operational improvements. The interpretation of utility data to guide conservation action is becoming an essential management capability.

4.3. Targets and Standards

Every building can have an individual energy target, based on its actual and potential energy performance. The target guides allocation of effort and resources, planning of improvements, and performance objectives for staff and service providers. Building owners should adopt good practice design/retrofit standards for individual building systems, as identified by the CaGBC program, to be incorporated into specifications and service agreements.

4.4. Implementation

There are typically three streams of activity involved in implementing energy efficiency improvements in existing buildings. First are operations – reducing "on-time" for building systems, shutting equipment off during unoccupied periods and adjusting building control "set-points". This is the least cost, highest payback stream, but requires training and accountability for operators and engagement of tenants. Second is re-commissioning – testing, diagnosing, repairing, upgrading and adjusting building systems to perform to their best potential. This is generally a relatively low cost stream with a good payback, and requires direct involvement of operators as a learning process, and to ensure high performance is maintained over time. The third stream is system redesign and retrofit projects – lighting, ventilation and hydronic system upgrades, and replacement of plant and equipment. This is the highest cost stream and requires a robust business case.

Every building has its own unique set of opportunities. The performance indicators derived from benchmarking point to which streams apply to which buildings. In general, the lower cost streams should be implemented first in order to gain immediate savings with high returns, engage and train operators, and build internal confidence and capacity for tackling large capital projects.

4.5. Performance Monitoring and Reporting

Transparency of performance maintains organizational engagement and commitment, and drives continuous improvement. Operators and property managers should have access to monthly changes and trends in energy use for their building so they can make the connections between cause and effect – how their actions and operating practices impact performance – and take appropriate measures for improvement. Executives should see quarterly progress reports compared with baselines and targets. High performing buildings and large improvements should be recognized and celebrated, and corporate reporting should include targets, actual savings, and profiles of measures implemented and improvements made.

4.6. Continuous Improvement

Energy performance management is a continuous management system which needs to respond to new standards and technology, and improved operating procedures. As the energy efficiency of the office building sector as a whole continues to rise, and better standards and practices continue to emerge, so individual building targets are raised and the cycle of continuous improvement takes us to *20 by '15* and beyond.

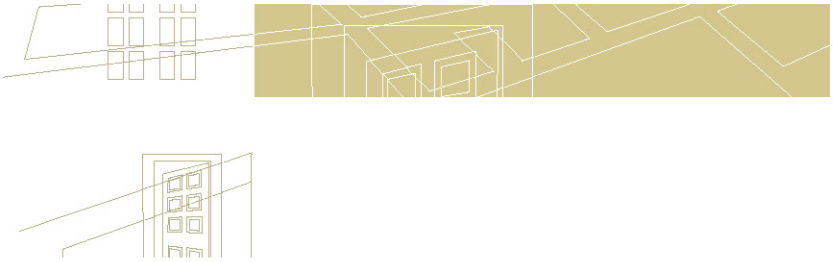
5. MAKING A DIFFERENCE

Canada's real estate industry is positioned to have a meaningful impact on the climate change mitigation agenda, through both its own potential to demonstrate greenhouse gas emission reductions, and the example it can provide to other building sectors, other parts of the economy, and other regions of the world. The methodology, metrics, standards and tools described in this paper did not exist a year ago. The commercial office sector and government real property departments have helped, through their participation in the CaGBC pilot projects, to both substantiate the opportunity for deep cuts in energy use and greenhouse gas emissions, and develop the means to achieve and sustain them. REALpac's *20 by '15* target takes this leadership to the next level.

> **"Ontario Realty Corporation is committed to systematically working towards energy efficiency targets for high performing buildings across its whole portfolio. The RealPac 2015 target is a useful development in moving this agenda forward."**
>
> **Gavin Maher, Senior Sustainability Program Specialist, Ontario Realty Corporation**

The common theme through this rapid evolution has been that nothing is what it had seemed. Use of more efficient technology does not necessarily achieve optimal performance – attention to system design and standards are equally important. Effective building operations and engagement of tenants are essential to high performance, and expected to provide at least half of the projected energy and emissions savings. There is no apparent correlation between building age and energy performance, and

even top-performing buildings today have significant room to improve. And the REALpac target can be reached, and median energy use level for the commercial and government office sectors reduced by up to one half, simply by consistently practicing what we already know how to do.



www.realpac.ca

REALpac
Real Property Association of Canada
Association des biens immobiliers du Canada

Intelligent – Influential – Informative

APPENDIX C

Attach Energy Coach Program Overview

The Energy Coach Program:

A mentorship in energy and environmental management

In association with:

uniongas
A Spectra Energy Company

ENBRIDGE

GTAA Partners in Project Green
A PEARSON ECO-BUSINESS ZONE

Excellence in Manufacturing Consortium

Understand the issues that affect your energy costs, and gain the knowledge to effectively manage and optimize your opportunities for savings

360 Energy Coach
Your Sustainable Energy Partner

Growing a culture of conservation

On a per capita basis, North America is the world's number one consumer of energy. Our growing appetite for energy raises the question of sustainability. What long-term affect does this have on the environment and our society? How much longer can we continue to consume at the same rate?

Companies often cite a lack of time, resources or expertise as reasons for poorly executing an energy management program. However, with our current economic climate, it is essential that behaviors and attitudes adjust (towards energy and the environment) if an organization is to succeed long-term.

As the volatility of energy prices affects all industries, strategies for coping with rising costs are relevant to all organizations. Creating a culture of conservation is a reflection of an organization's core values and improved social, fiscal, and environmental responsibility will illustrate an organizations leadership in their industry and community.

The journey to energy excellence is a reflection of a well-executed and successful energy management program. The Energy Coach can put you on the path to success!

A 3 step process

Step 1: Evaluate

Determine which managers should be on your team with a thorough Energy Radar Assessment. A site walk-through combined with individual staff interviews will quickly capture and categorize the energy management activity and opportunities for your site. The report generated segments your current state into 6 key areas: Energy Mandate, Energy Planning, Energy Procurement, Resources, Organizational Integration, and Energy Data. The results are used to identify and build an effective, cross-functional energy team to successfully implement an energy program.

Step 2: Plan

Continue your journey to energy excellence in a fast paced 1 day interactive session where you will be exposed to more than 50 world-wide energy management best practices. During the session, you will be provided with all the tools and templates required to get your site on the path to success. Use the comprehensive energy scorecard to pin-point, prioritize and execute your customized energy program on 3 separate levels. Combined with step 1, an organization can now develop targets for cost and consumption reduction.

Step 3: Act!

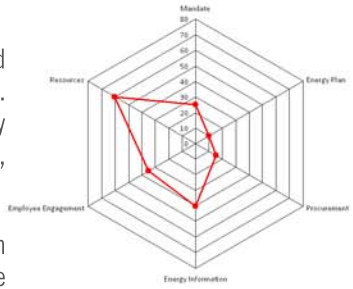
Develop your plan and get it launched with support from 360 Energy. By reviewing your energy plan, we will verify that your goals and objectives meet the SMART criteria [Specific, Measureable, Achievable, Realistic, Time bound]. We'll assist you in presenting your comprehensive plan to senior management, ensuring your resources are available to meet your reduction targets.

With weekly interaction, exposure to a variety of international best practices, quarterly reviews with senior management, and a minimum 12 months of overall support, the appointed energy team will end the coaching process equipped with the tools and knowledge to continue the program well into the future. Through this process, employees will be motivated and empowered to control energy on a daily basis with systems in place to verify their actions and savings.

Site Assessment

Energy Radar Assessment

The assessment functions as a benchmark outlining the strengths and weaknesses of an organizations current energy management program. Brief interviews with key staff members probe into the areas of energy planning, energy procurement, energy mandate, resources, organizational integration, and energy data.



This tool is intended to provide a clear picture of what areas an organization can expect to improve in after successful completion of the Sustainable Energy Planning Workshop.

Site Walk-through

Have a guided audit performed by a P. Eng to identify areas of concern to incorporate into the sustainable energy plan. When planning for budgetary requirements, determining a priority of technical audit areas is essential to ensure these projects are implemented.

Sustainable Energy Planning Workshop

Participants of the one-day Sustainable Energy Planning Workshop will assess their current energy management programs by developing a scorecard and baseline map of their current activity. Exposure to over 50 world-wide best practices and energy saving techniques will motivate companies to capitalize on missed opportunities while identifying what resources they have available to reduce and control future energy costs.

Module 1

Information Gathering

Five key areas of focus are reviewed to assess an organization's current energy management plan. These areas include: energy data management, energy supply management, energy use in facilities, equipment & systems efficiency, organization integration

Module 2

Assessment

The participant has a chance to fill out their own performance scorecard showing the opportunities for savings. World-wide best practices are scrutinized and a break-out session on how to complete an energy baseline map will be completed. The differences between energy processes, programs, and projects are discussed.

Module 3

Building the Plan

The six key components of a successful plan are discussed. Participants are given a template and review the importance of an energy mandate.

Module 4

Implementation

Key planning activities and strategies on how to present and receive approval from senior management are discussed.

Module 5

Monitoring & Feedback

Accountability and regular reviews and updates are crucial to the success of any plan. Various techniques and a six- step problem solving process are examined.

360 Energy Support

Across North America, 360 Energy has built a reputation as one of the leading energy services firms providing world-class energy management training. This program allows for unparalleled candid dialogue and discussion with one of the most prominent energy experts in Canada.

Objective third-party support and feedback is crucial in motivating organizations to succeed. With a minimum 12 months of support, the program equips an organization with the tools necessary to evaluate their current level of energy management activity, receive an energy mandate from senior management, write a SMART energy plan, create an energy team that is engaged in implementing the set goals and objectives, and achieving energy cost and consumption reduction targets.

Drawing on international experience, the expert advice provided on a weekly, monthly and quarterly basis will provide participants will valuable recommendations and strategies.

There are measurable benefits for all participants regardless of previous industry or personal experience. All participants will improve cost control and bottom-line performance.

Here are a few example modules:

GHG Footprint Identification

Discover the amount of greenhouse gas emissions associated with your facility's operations and understand how to prepare for future environmental regulations. Increase your profile in the community be reducing your operation's impact on the environment.

Employee Awareness Initiative

We'll assist you in avoiding common mistakes such as hosting an 'energy event' by helping create a sustainable, employee-driven awareness program. Employees will begin making timely and educated decisions regarding their day-to-day energy use activity.

M&T System Assessment

You can't evaluate future energy savings if you don't have a well functioning energy monitoring program. You will asses your current system and evaluate the opportunities for improvement. Combining automated daily reports of usage and price with production data can lead to significant savings.

Baseline Energy Audit

Take your original walk-through audit to the next level and determine how much energy is being used by each cost center. This offers your site a comprehensive road map for energy management.

Key Energy Systems Review

Combined from around the world energy management best practices and saving techniques are scrutinized to save you money quickly and with little-to-no capital investment. Whether it is HVAC, boilers, air compressors, lighting, or any other internal system, we've got you covered.

The blend of incomparable expert insight and unmatched support distinguish this program from its competition.

This program is being provided in association with:

Excellence in Manufacturing Consortium

GTAA Partners in Project Green
A PEARSON ECO-BUSINESS ZONE

Program funding provided by:

Enbridge Gas Distribution
A Spectra Energy Company

ENBRIDGE

360 Energy Coach is a product of: 360 Energy Inc. Your Energy Network

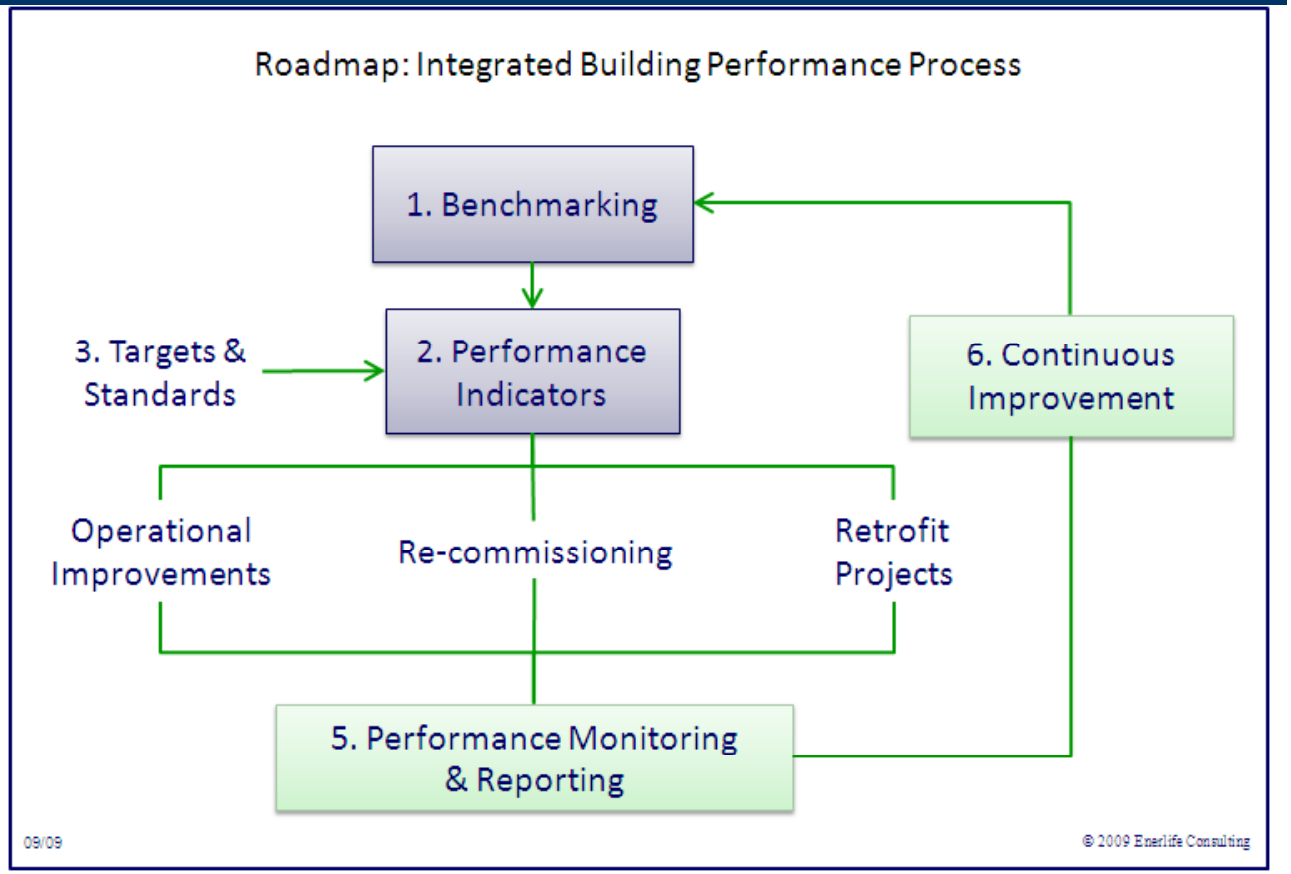
APPENDIX D

ATTACH POWER POINT PRESENTATION - USING PERFORMANCE BASED CONSERVATION WITH UTILITIES

Using Performance Based-Conservation with Utility Programs

More Results at Less Cost

Performance Based Conservation Process



Learning from Performance Based Conservation

- no apparent correlation between building age and energy performance
- more efficient technology does not necessarily achieve optimal performance
- attention to system design and standards is key
- effective building operations and engagement of tenants are essential to high performance = half projected energy savings.
- even top-performing buildings have significant room to improve

Role of Regulated Utilities

- more direct link to conservation savings, measurement and verification than the current approach
- includes all forms of energy plus water
- basis for co-operation between gas and electric utilities

Customer focused delivery

Utility Role: Recruitment

- either alone or in concert with sector specific organizations such as REALpac, BOMA, Retail Council of Canada, Social Housing and Services Corporation, Federation of Rental Properties of Ontario, or the equivalents in the industrial sector

Promotion and Customer Relationships

Step 1: customer data to inform benchmarking

- Benchmarking: starting point for energy efficiency
- Lower performance should factor into target setting and individual performance objectives.
- Management should know how their properties compare with each other and with the similar buildings

Transforming utility data into management information

Step 2: building and technical analysis to develop performance indicators

- drilling down into the components of energy
- create building-specific targets
- identifies which buildings are candidates for operational improvements, re-commissioning and/or retrofits

Interpretation of utility data to guide conservation is essential

Step 3: targets and standards

- individual energy target, based on a building's actual and potential energy performance
- guides allocation of effort and resources, planning of improvements, and performance objectives for staff and service providers
- basis for applying adopt best practice design/retrofit standards for individual building systems
- should be incorporated into specifications and service agreements from service providers

Helping building managers understand their opportunities

Each building: unique set of opportunities

- performance indicators derived from benchmarking point to which streams apply to which buildings
- lower cost streams should be implemented first in order to gain:
  - immediate savings with high returns
  - engage and train operators
  - build internal confidence
  - build capacity for tackling large capital projects

Not a one shot intervention

Step 4: Implementation

a) Operational Improvements
b) Recommissioning
c) Retrofit Projects

Utility Programs can help in each phase

4 (a) Operational Improvements
- sponsoring workshops, technical advice

- reducing “on-time” for building systems
- shutting equipment off during unoccupied periods
- adjusting building control “set-points”.
- least cost, highest payback stream
- requires operator training and accountability
- requires tenant engagement

4(b) Recommissioning – sponsoring workshops, technical advice

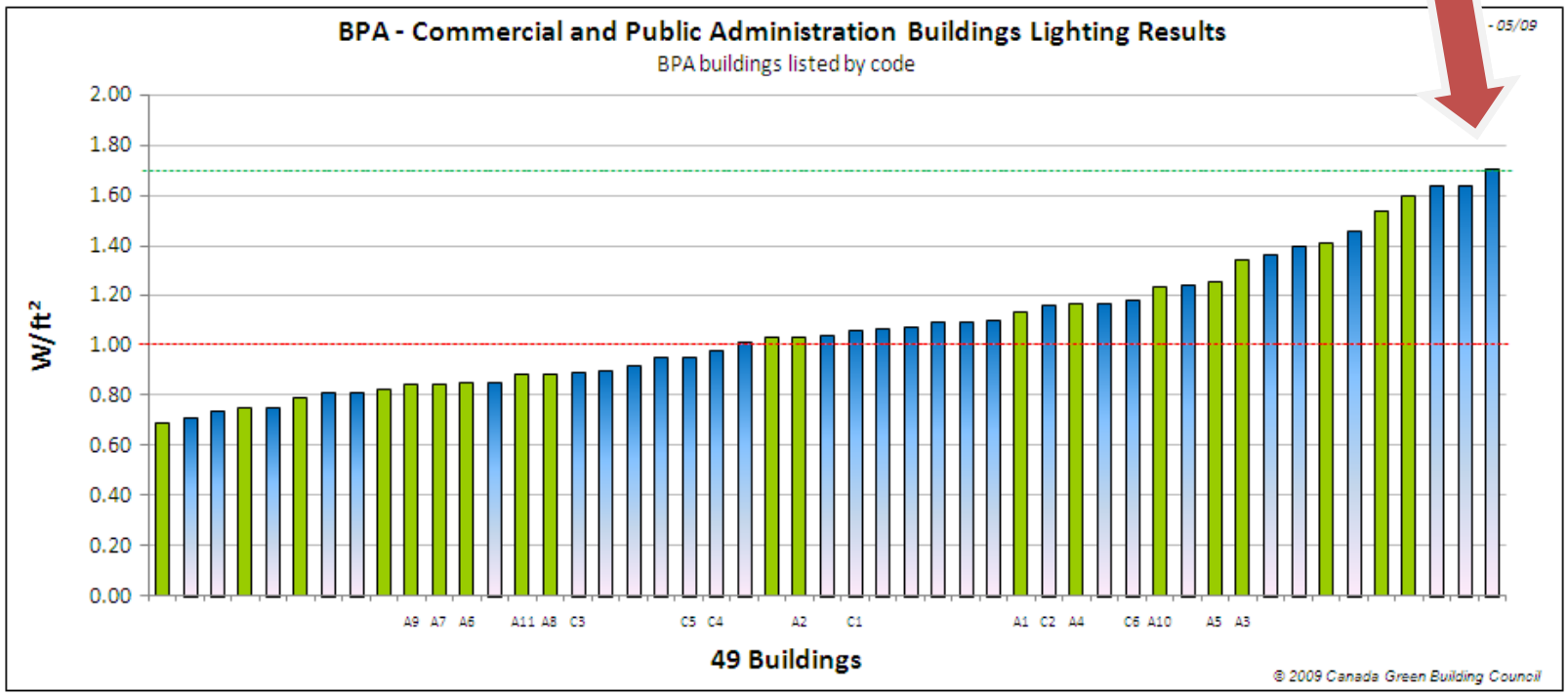
- testing, diagnosing, repairing, upgrading and adjusting building systems to perform to their best potential
- relatively low cost stream with a good payback
- requires direct involvement of operators as a learning process to ensure high performance is maintained.

4 (c)Retrofit Projects: financial incentives with performance criteria

- system redesign
- retrofit projects such as lighting, ventilation and hydronic system upgrades
- replacement of plant and equipment
- highest cost stream and requires a robust business case

Incentives without performance criteria – where are the savings?

T8 retrofit $$$$$



------ The MNECB lighting power density for buildings is 1.7 W/ft²

------ The ASHRAE 90 lighting power density for buildings is 1.0 W/ft²

Public Administration Buildings

Commercial Office Buildings

Step 5: customer data for performance monitoring and reporting

- transparency maintains organizational engagement and commitment, and drives continuous improvement
- access to monthly changes/trends in energy use connects cause and effect
- understand how actions and operating practices impact performance
- appropriate measures for improvement

Closing the Loop

Additional Roles for Utilities in Step 5

- ensure executives see quarterly progress reports compared with baselines and targets
- corporate reporting should include targets, actual savings, and profiles of measures implemented and improvements made

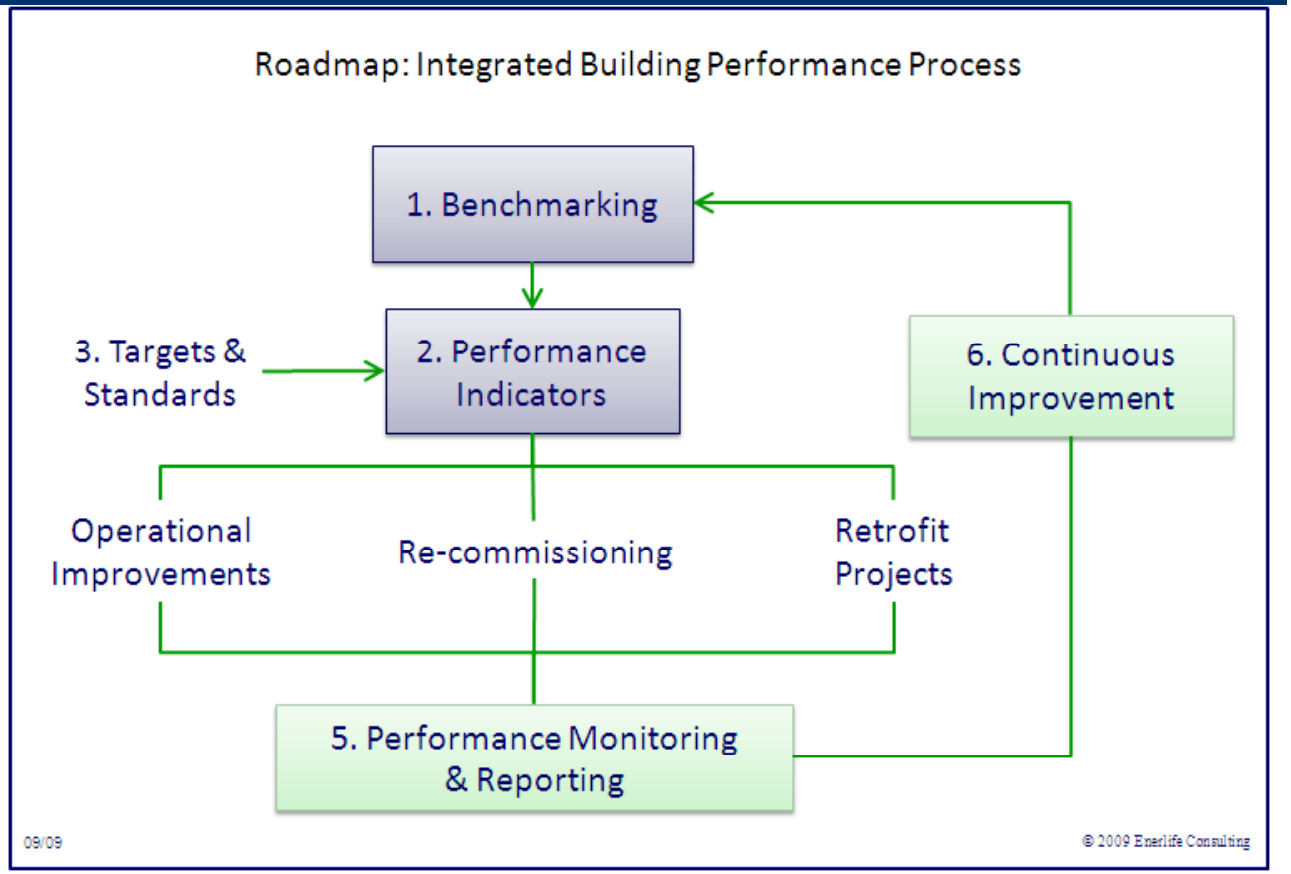
Celebrate high performing buildings and large improvements

Step 6: ongoing support to ensure savings persist

- energy performance management is
  - continuous management system
  - response to new standards and technology
  - improved operating procedures.
- as energy efficiency of building sector improves, better standards and practices continue to emerge, individual building targets can go up
- continuous improvement to *20 by '15* and beyond

Opportunity for continuous customer service

Performance Based Conservation Process



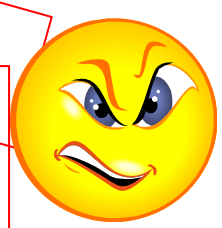
APPENDIX E

ATTACH RESIDENTIAL CONSERVATION MAP

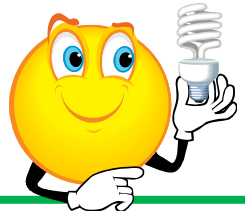
"I refuse to pay for a green audit until all new home building starts reflect this green building code. If new homes are not green right from the get go then why should mine be? Send your $300.00 bill to Suzuki."

The Ontario Real Estate Association disagrees. It said there is nothing simple about the new audit. Gerry Weir, president of the OREA, warned the audits could end up costing sellers thousands.

Home sellers face $300 'green' audit



TORONTO _ Premier Dalton McGuinty is defending a plan to saddle homeowners with a mandatory $300 energy audit as part of his Green Energy Act, dismissing critics who say this is yet another way to tax overburdened residents.



Proposal for "Residential Conservation"

Marion Fraser, Fraser & Company

While homeowners will have to get a private contractor to do an energy audit before selling, there will be no requirement to take any action – the measure is simply intended to inform potential buyers what state of energy efficiency a property is in so they can take action if desired.

Hon George Smitherman: Indeed, I've had the opportunity in this House and outside the House to say that as we move forward to implement this, we'll look for all inputs, from realtors, from the opposition, to do this in a fashion which is very reasonable. It will take some time to be able to do this on a standardized basis across the province and to have the appropriate array of people who are certified to do so. We'll be happy to work with the opposition on implementation details that give-

IRONIC…BUT?

- Green Energy Audits have the potential to save consumers thousands over the life of their home, but they object to the $300 cost
- All parties agreed to Private Member's Bill on Green Audits
- Tories 2007 platform included home audits
- Toronto Star usually supports consumer protection

REACTION IS SYMPTOM OF LARGER ISSUE

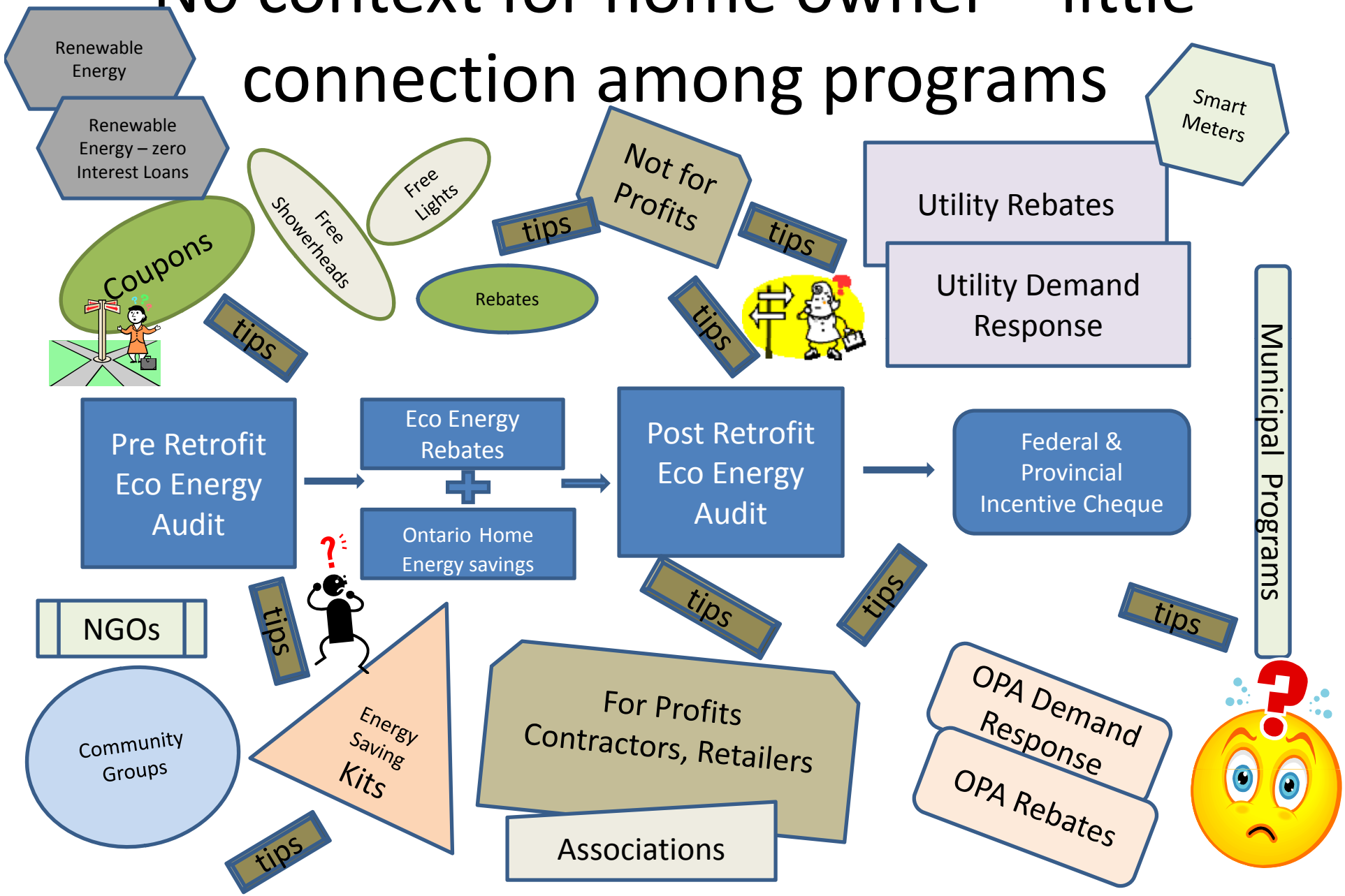
- Consumers are confused by plethora of programs
- Consumers feel their "home is no longer their castle"

SOLUTION – Empowerment

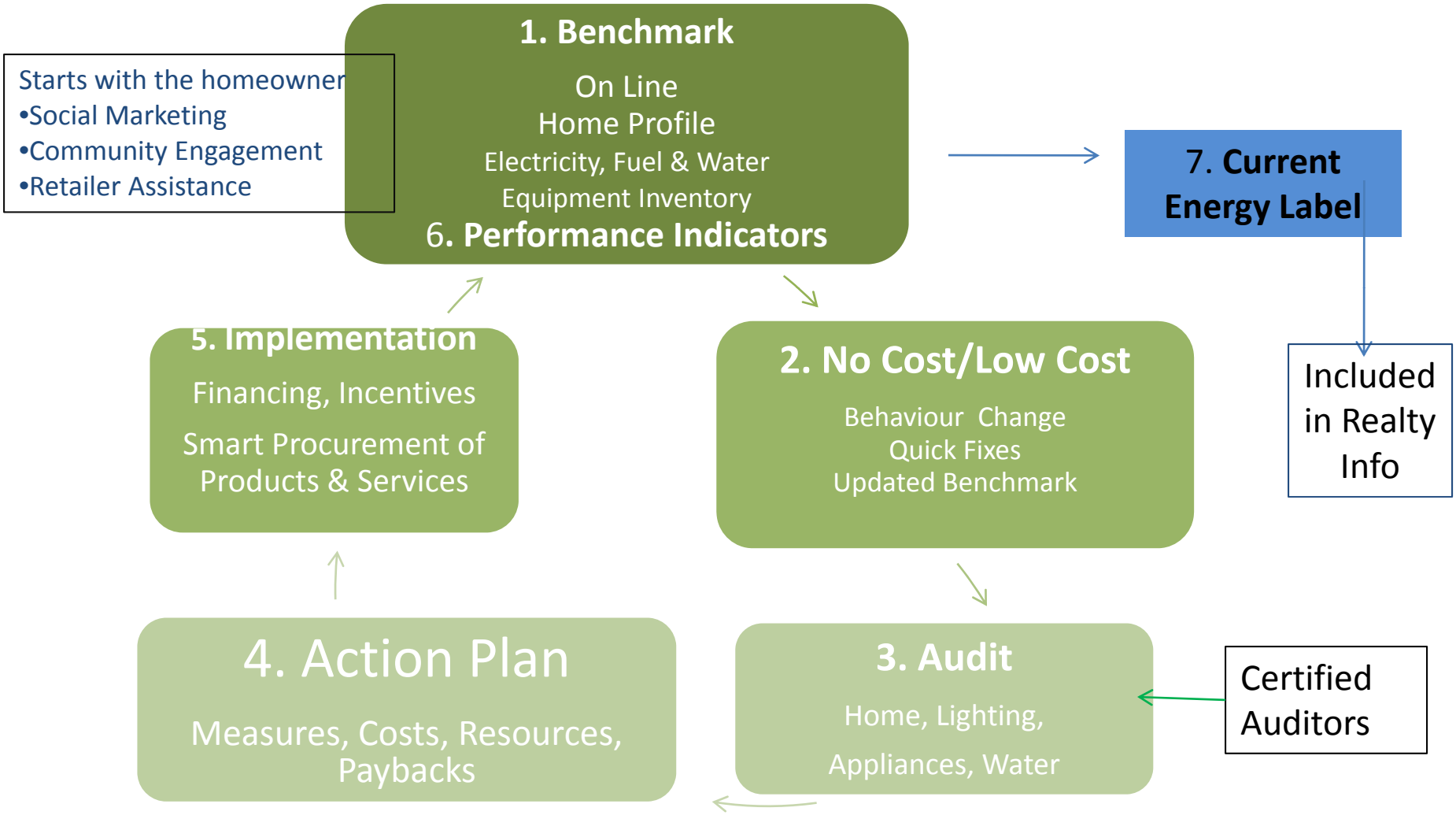
- Put homeowners back in the driver seat
- Give them a "conservation road map"
- Engage the LDCs to facilitate process locally
- Use not-for-profit and for-profit service providers for audits and retrofits
- Support with provide wide financing and incentive mechanisms.

Current Programs – to name a few

No context for home owner – little connection among programs



Proposed Residential Conservation Map



Key Elements of Proposal

1. Empower Homeowners through an “online” benchmarking process for energy and water
2. Use community based, social marketing to engage homeowners to understand linkages between the home, their equipment and appliances and their behavior
3. LDC support #1 & 2 and become gateway to auditors and contractors
4. As audits are expensive and key elements for “retrofits” and post retrofit verification they aren’t the best tool for “time of sale” activity and information
5. Much work is currently in progress on Labeling; likely link to current audit programs (NRCan, CaGBC, MMAH)
6. In advance of full scale labeling program, require disclosure of energy and water use data at time of sale – (valuable service for utilities in informing customers)

Current Residential Programs

Program Name	Services Provided									Financial Incentives							
	Assistance - General	Assistance - Technical	Education/Information	Product Exchange	Product Give-away	Product Recycling/Pick-up	Seminars/Workshops	Software	Training	Discount/Coupon	Grant	Loan	No/Low Interest Loan	Rate Reduction	Rebate	Subsidy	Tax Incentive
Residential																	
20/20 The Way to Clean Air			•														
City of Toronto Residential Outreach Program			•														
Community Go Green Fund											•						
Cool Savings Rebate Program															•		
ecoENERGY for Buildings and Houses	•								•								
ecoENERGY Retrofit - Homes															•		
Every Kilowatt Counts (EKC)			•														
Go Solar Ontario			•														
Home Energy Savings Program (HESP)															•		
Keep Cool						•									•		
Net Metering															•		
Peaksaver															•		
Pilot Solar Domestic Hot Water Heating Program																	

Current Residential Programs (cont'd)

Program Name	Services Provided									Financial Incentives							
	Assistance - General	Assistance - Technical	Education/Information	Product Exchange	Product Give-away	Product Recycling/Pick-up	Seminars/Workshops	Software	Training	Discount/Coupon	Grant	Loan	No/Low Interest Loan	Rate Reduction	Rebate	Subsidy	Tax Incentive
Programmable Thermostat Rebate Program															•		
Residential Efficient Space Heating (R-4)			•								•						
Residential Efficient Water Heating Conservation Retrofits (R-3)		•	•		•												
Residential Toilet Replacement Rebate															•		
Residential Washer Rebate															•		
RET Screen International Clean Energy Support Centre		•	•						•								
Retail Sales Tax (RST) Exemption on Renewable Energy Systems															•		
Retails Sales Tax (RST) Exemption on ENERGY STAR® Household Products																	•
The Great Refrigerator Round-up						•									•		
Toronto Community Housing Corporation - Appliance Renewal Program		•			•												